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KERN COUNTY BIKEWAYS PLAN

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*County planning Kern
Traffic Bicycles*

AS PROPOSED BY

THE KERN COUNTY BOARD OF SUPERVISORS

UPON THE RECOMMENDATION OF

THE KERN COUNTY PLANNING COMMISSION

PREPARED BY

THE KERN COUNTY PLANNING DEPARTMENT



"Functional bikeway system planning is the process of translating objectives determined in the policy planning phase into specific proposals to be incorporated into a comprehensive bikeway system master plan. The goal of functional planning activity is the production of a master plan for the systematic development of local facilities."

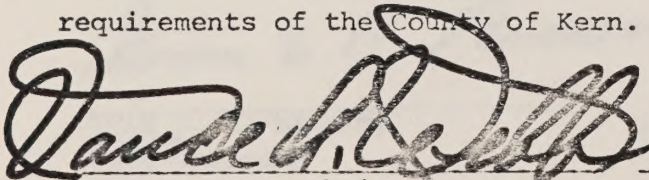
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CERTIFICATION OF ADOPTION

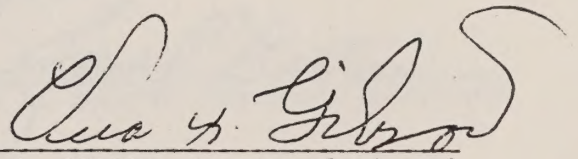
by the

KERN COUNTY BOARD OF SUPERVISORS


By Resolution No. 74-699 , dated 12-23-74 , the Kern County Board of Supervisors adopted the herein contained "Kern County Bikeways Plan" as part of the Circulation Element of the Kern County General Plan after receiving a recommendation thereon from the Kern County Planning Commission and conducting a public hearing pursuant to all statutory requirements of the State of California and all ordinance requirements of the County of Kern.



VANCE A. WEBB, Chairman
Kern County Board of Supervisors



VERA K. GIBSON, County Clerk and
Ex-Officio Clerk of the Board of
Supervisors



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CERTIFICATION OF APPROVAL

by the

KERN COUNTY PLANNING COMMISSION

By Resolution No. 139-74, dated 10-21-74, the Kern County Planning Commission approved the herein contained "Kern County Bikeways Plan" as part of the Circulation Element of the Kern County General Plan after conducting a public hearing in compliance with all statutory requirements of the State of California and all ordinance requirements of the County of Kern.

Ivan E. R. Beavan

IVAN E. R. BEAVAN,
Vice Chairman

Jack L. Dalton

JACK L. DALTON, Director/Secretary

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INTRODUCTION

The Kern County Bikeways Plan has been prepared at the request of the Board of Supervisors in recognition of the need for a coordinated system of bikeways in Kern County to better meet the recreation and transportation needs of our residents.

It is expected that this plan will be of use to policy-makers and cyclists in creating an environment conducive to safe, efficient, and pleasant bicycling. It should be used to effectively guide the allocation of public resources, educate the public to the needs of cycling, and to recommend actions guiding the expenditure of public funds.

The Plan should not be considered a static document, but rather as a means for stimulating public input and governmental action toward a continuing process of providing for the needs of Kern County bicyclists.

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THE BICYCLE RENAISSANCE

During the 1890's the "bicycle boom" experienced in this country helped to usher in the, then infant, automobile industry by giving it needed roads, experience in mass production technology, a well distributed system of bicycle repair shops which were easily adapted to auto needs, and several other mechanical innovations such as differential steering and expansion brakes.

As the popularity of the automobile increased, the use of the bicycle, especially by adults, decreased decidedly. There were three basic reasons for this shift in mode preference:

1. The automobile promised a higher level of convenience, as well as greater range and load capacity.
2. Those men most talented in the industrial field, for a large part, directed their attention toward the development of the automobile.
3. Industrial research and development capital was directed toward automobile production.

From 1900 until about 1960, the bicycle lost almost all status as a viable mode of transportation for the adult American. The only real exceptions to the above statement occurred during the depression and the two World Wars. During these periods fuel was scarce and a low cost mode of transportation was desirable.

The current trend toward a greater use of bicycles in the United States started in the 1960's. There are a number of reasons for this recent resurgence, most of which can be explained by saying that the bicycle has many inherent qualities which make its use good medicine for some of the economic, technological and social ills of our country.

Listed below are the reasons most commonly cited as being responsible for the current "boom" of the bicycle industry in America

1. A strong desire for a pleasant method of acquiring and maintaining physical fitness. Jogging, running in place, isometrics, etc. tend to become monotonous, thus discouraging continued use. Bicycling is fun.

2. Cycling is an excellent family activity. The generation gap between family members closes on a bike. Many families join bike clubs, go on overnight bike hikes and Youth Hostel trips. The Bureau of Outdoor Recreation of the U.S. Department of the Interior, has reported cycling as the fastest growing outdoor recreation activity in a country that has become increasingly outdoor recreation oriented.
3. Cycling is a relatively inexpensive activity, whether done for recreation, fitness or short-haul transportation.
4. Ecology groups have made the bicycle the symbol of their drive for a cleaner, healthier and more pleasant environment, citing it as the only ecologically "clean" vehicle in existence. Additionally, and what is perhaps more important, riding a bike refreshes the spirit as well as the body, giving the rider a sense of well being, of being on his own.
5. Bicycles offer at least a partial solution to many traffic problems. They occupy much less space than the automobile, both while in use and during periods of storage. They require almost no enroute service facilities and cause very little property damage in case of accident.
6. In addition to the reasons stated above, it should be mentioned that the collective result of individual manufacturer's efforts to design and manufacture bicycles geared to the American taste, and their manufacturing, advertising and marketing skills, have had their own sales-inducing effects.

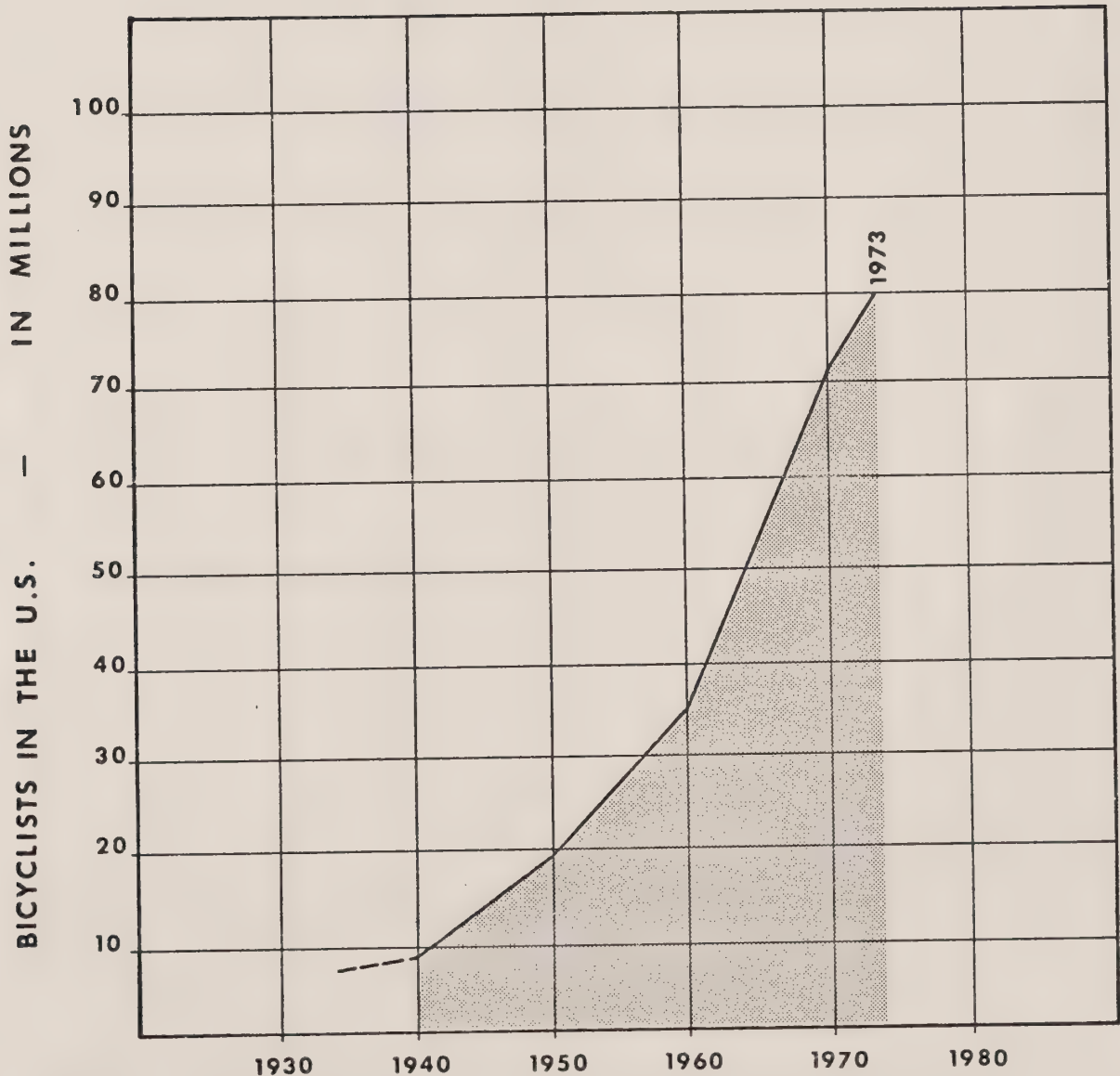
Whatever the reasons, it is a fact that bicycles are becoming so prevalent in our society that their use can no longer be viewed as a mere fad. In 1972, for the first time in over fifty years, more bicycles were sold in California than were automobiles.

Kern County residents are becoming enthusiastic bicyclists also. A 1973 survey divulged that over 34% of Kern County's resident population are owners and users of bicycles for transportation, recreation, or both. A poll of Kern County bicycle shop owners was taken in 1972, which revealed that sales were up over 1971 by at least 20% for most owners and as much as 81% for one.

It would appear that, based on these and similar statistics, a well planned and strategically implemented bikeways system would not only be a useful asset to the County but is a needed element of our local transportation system, if that system is to serve the needs and wishes of its users and endorsers.

NUMBER OF BICYCLISTS IN THE UNITED STATES

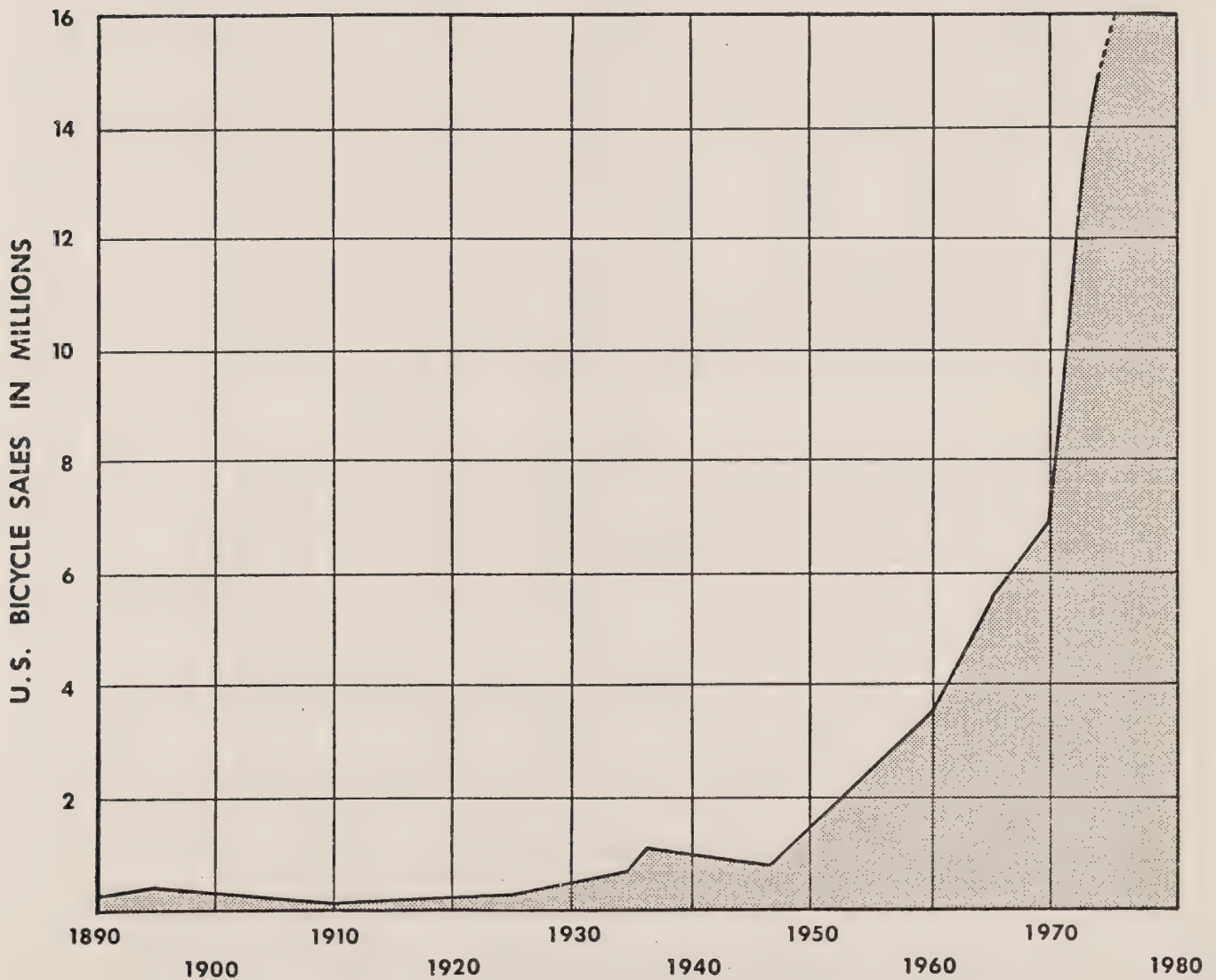
FIG. 1



SOURCE: Research and Planning Analyst, Public Safety Department,
Automobile Club of Southern California

BICYCLE SALES IN THE UNITED STATES

FIG. 2



SOURCE: Research and Planning Analyst, Public Safety Department,
Automobile Club of Southern California

REASON FOR BIKEWAYS PLAN

It is estimated that one out of every three persons in the United States is a bicycle rider. If this estimate holds true for Kern County, there are approximately 114,000 persons who, at various times, are competing with automobile drivers for a portion of existing road rights-of-way within this county. If the current increase in cycling is merely a fad, the development of bikeways is not a very important issue. It appears, however, that it is not a fad, and estimates are that by 1980, one half of our nation's population will depend to some degree on the bicycle for its local transportation needs. This estimate may even be too conservative if solutions are not found to our present fuel shortage and air pollution problems.

It is very possible that the present crisis will necessitate the development of not only new power sources for transportation vehicles but completely new hardware. This may not only change the design of individual transportation units but may cause an eventual renovation of our entire transportation system.

If, for environmental and economic reasons, our present transportation systems do become impractical, an interim system will be needed. It will take time for new facilities to be designed, accepted, and implemented. During this interim period, a transportation mode will be needed which has the following attributes:

1. The hardware must be relatively inexpensive and readily available.
2. The mode should be capable of utilizing existing rights-of-way.
3. Any additional facilities needed to make the interim system work should be inexpensive and require a minimum of construction time.
4. Any fuel required by the interim mode must be available and relatively inexpensive.

The bicycle as we know it meets all the above criteria and, therefore, would be a logical interim vehicle for intracity travel.

Whether bicycles ever become the major mode used for short trips or not, there is still a large percentage of our population that currently rides bikes and thus needs a well designed bikeways system.

The paramount "need" for bikeways is based on a definite hazard which now exists to the bicyclist as he traverses public road rights-of-way. Every year conflicts between motorists and bicyclists cause a needless number of deaths and injuries. See Figures (3 and 4). As the number of bicyclists continues to increase, so will the number of deaths and injuries if provisions are not made to reduce conflicts between bicycles and motor vehicles. Realizing this, the Kern County Board of Supervisors ordered the preparation of a comprehensive bikeways plan for Kern County. This method of approaching the problem was taken with hopes of providing a guide for the systematic development of bicycle facilities throughout the county and of insuring the continuity of routes through various jurisdictions.

CALIFORNIA BICYCLE ACCIDENT STATISTICS

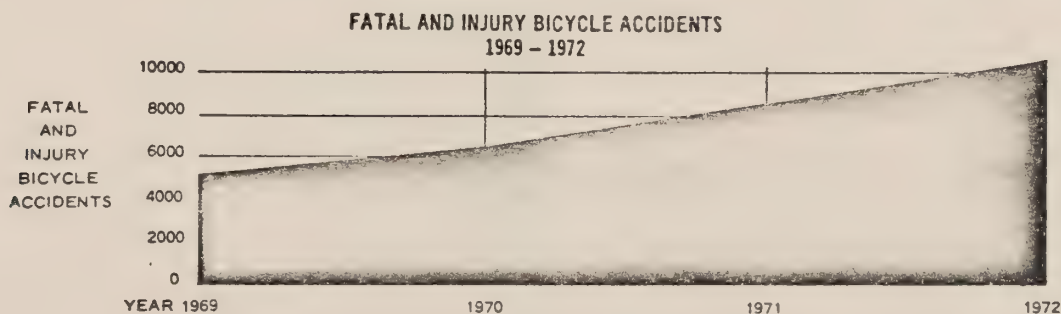
1969-1972

FIG.3

BICYCLISTS KILLED AND INJURED BY AGE BY YEAR

AGE	Y E A R							
	1969*		1970		1971		1972	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
0- 4	2	124	-	81	1	101	3	152
5-14	46	4,148	67	4,687	55	5,219	(75)	(6,610)
15-24	8	839	11	1,131	27	2,515	24	3,118
25-34	3	122	1	151	1	290	10	434
35-44	1	67	-	71	2	88	1	123
45-54	1	38	2	55	1	59	2	112
55-64	3	28	1	44	3	52	3	59
65 and over	4	39	4	42	4	56	9	68
Not stated	1	38	1	42	1	98	1	167
TOTAL	69	5,443	87	6,304	95	8,478	128	10,843

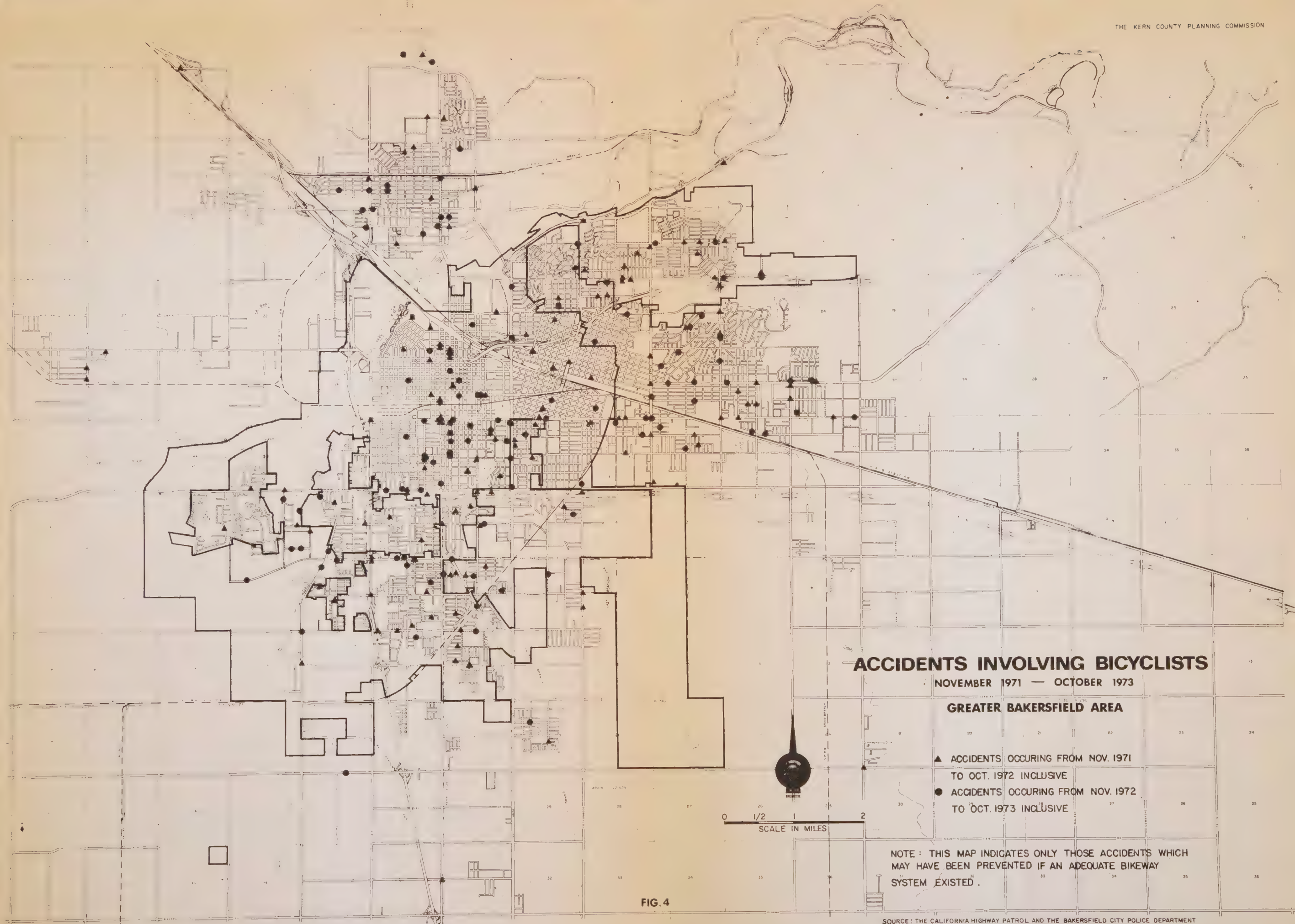
* Adjusted figures



FATAL AND INJURY BICYCLE ACCIDENTS BY YEAR

	Y E A R			
	1969	1970	1971	1972
Total fatal accidents	4,427	4,277	3,953	4,426
Fatal bicycle accidents	66	89	98	129
Percent of total	1.5	2.1	2.5	(2.9)
Total injury accidents	159,927	158,391	160,182	172,197
Injury bicycle accidents	5,178	6,313	8,471	10,493
Percent of total	3.2	4.0	5.3	(6.1)

SOURCE: CALIFORNIA HIGHWAY PATROL



PROJECT HISTORY

Bikeways in Kern County were perhaps first visualized by those involved in the preparation of the Bakersfield Metropolitan Area General Plan, adopted in 1961. This plan provided for "riding and hiking trails" through the Bakersfield area. At that time, the trails were visualized as multi-purpose rights-of-way, to be used commonly by pedestrians, equestrians, and bicyclists as purely recreational facilities.

Since that time, parts of the proposed trail have been constructed. However, use of the facility is restricted to use only by equestrians.

Since the opening of Cal-State Bakersfield in September of 1970, the need for bikeways in the Bakersfield Metropolitan area has grown sharply. This need and the needs of Bakersfield cyclists in general were first made known to city and county officials by Mrs. Wilbur Rickett and Judge Earle Gibbons in 1971. Mrs. Rickett and Judge Gibbons were particularly interested in the establishment of a bikepath from Cal-State College to Bakersfield Community College along the Kern River. They felt this route had utilitarian possibilities in addition to the recreational uses proposed for "riding and hiking trails" by the Bakersfield Metropolitan Area General Plan. The path could be used by commuting students and workers employed throughout urbanized Bakersfield.

The idea was discussed with the Board of Supervisors, and a study was initiated by Judge Gibbons and Mrs. Rickett to determine the proposal's feasibility. Assistance and donations pending legislative approval were obtained from many public and private sources, including the following:

1. Mr. Wilbur Rickett, of Rickett, Reaves, and Ward, Civil Engineers, offered the services of said firm and secured commitments from other engineering firms for the right-of-way survey and the preparation of the right-of-way description.
2. Mr. Jack Turman, of Turman Construction Company, offered the use of his equipment and secured commitments from other heavy equipment companies for the clearing and grading of the bikepath.
3. The International Union of Operating Engineers Local 12 and the Teamster's Union Local 87 both offered the services of equipment operators for the project.

4. Golden Bear Oil Company (Witco Chemical Company) offered the equipment necessary to place the prime oil, providing the oil was purchased from that company.
5. Griffith Company agreed to provide asphaltic concrete transport and spreading equipment if said material was purchased from that firm.
6. The local United States Naval Construction Battalion (Seebies) agreed to construct the bridge proposed as part of the bike-path.
7. The right-of-way for the bikepath was to be obtained at no cost to the county from Tenneco West Incorporated and the Stockdale Development Corporation, the Southern Pacific Railroad, Mr. Owen Clark, and Mr. John Deeter.
8. The County Planning Department and the County Public Works Department offered their services in preparing cost estimates, mapping, and generally helping to expedite the proposal.
9. Sheriff Charles Dodge agreed to furnish labor by inmates from the county jail facility whenever it could be effectively utilized.

When it was felt that all bases were covered, the proposal was presented to the Kern County Board of Supervisors. The Board did not approve the expenditure of county funds at that time. However, it was evident at that meeting that many civic minded organizations and individuals were very interested in providing facilities of this kind, not only in the Bakersfield Metropolitan area, but throughout Kern County. It was for this reason that the Board of Supervisors ordered the Planning Department to prepare this plan.

Hopefully, with the proper implementation of this plan, a bike-ways system will be developed which will serve the needs of all Kern County residents.

PLAN METHODOLOGY

The following is a general summary describing the procedures utilized in the development of this plan. This section is included in an effort to provide the reader with some insight into what research methods were used and how the research material was synthesized to produce this document.

Once the order was given by the Board of Supervisors for the preparation of a Bikeways Study (See Pre-Project History section), the Planning staff began discussions as to the best method of approach.

It was decided that the first course of action should be to find out if other jurisdictions were experiencing similar demands for bicycle facilities and, if so, how they were dealing with them. Many letters were written to planning agencies, bicycle clubs, insurance companies, law enforcement agencies, legislators, etc. requesting any information which might help us in the development of a Bikeways Plan.

Numerous replies were received supplying us with what we felt constituted an adequate research library on bikeways. Our letters of request for information prompted invitations to bikeways design seminars and other related meetings. Some of these were attended by the Bikeways Plan project planner. These seminars and the extensive literature search directed us to new information sources.

Many local public officials and interested businessmen were interviewed in hopes of obtaining valuable information on official policies and the attitude of the public regarding bikeways. Although much valuable information was gained in this manner, the project staff felt that a more direct method was necessary to discover the attitudes and needs of the present and anticipated bicyclists in the county.

Much of the literature received from other agencies indicated that a bicycle users' survey was probably the most efficient method of obtaining the attitudes of the general bicycling public. A questionnaire was prepared and distributed throughout the county. The survey was intended to aid the staff by informing them of where bicycles are ridden most often, what types of trips they are used for, when

they are most often used, etc. It also gave the public a chance to make suggestions as to needed bikeways routes and solutions to problems they felt most critical.

The results of the survey, although replies were not overwhelming in number, were quite useful and, thus, worthwhile. The tabulated results of the Cal State Bakersfield portion of the survey are included in this section as an example of the type of information obtained.

Once this information was obtained, the Planning staff felt that a comprehensive bikeways plan was indeed merited for the county.

Using information derived from previously mentioned sources plus information resulting from a continuing study, a draft version of the Kern County Bikeways Plan was prepared by the project staff.

Said draft was made available to the public for review and comment. Copies of the draft were also sent to concerned governmental agencies for their review.

Several suggestions were received as a result of this review process. These suggestions were evaluated by the project staff, and the draft version was amended as needed.

The methodology explained above was utilized with hope of creating a bikeways plan which is functionally acceptable to as many as possible.

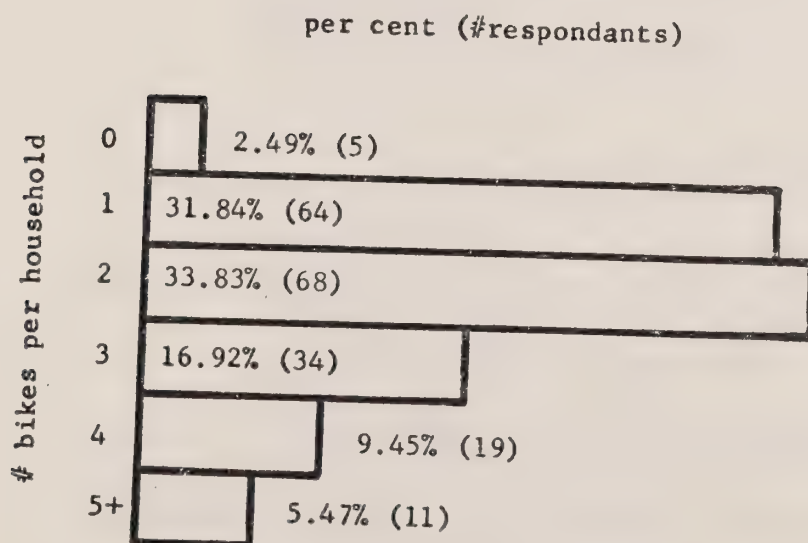
BICYCLE USERS SURVEY

CAL STATE BAKERSFIELD RESULTS

During the month of February, 1973 600 questionnaires were distributed to students of Cal State Bakersfield as part of the county-wide bicycle users survey mentioned earlier.

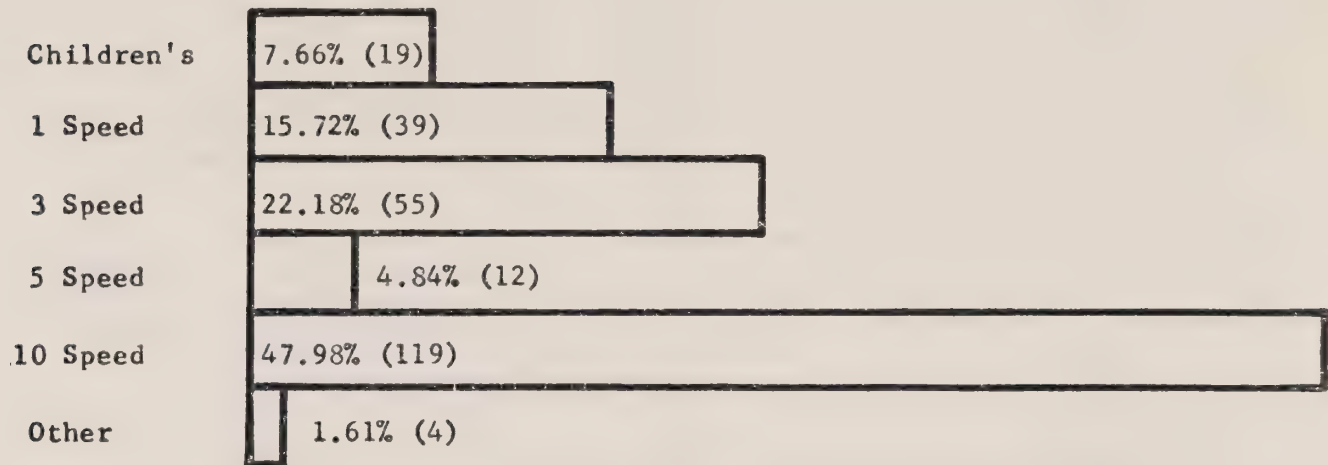
Response to the questionnaire was good at Cal State, yielding 218 or a 37% return. Most replies were very thorough. However, incomplete replies were tabulated also on the theory that the questions answered were the most important to the person replying. This means that the results should not be viewed in a rigid statistical sense, but more as a general indication of the attitudes of cyclists toward the factors listed. The responses to each of the questions are graphically portrayed below.

1. How many bicycles are there in your household?



Source: Kern County Planning Department

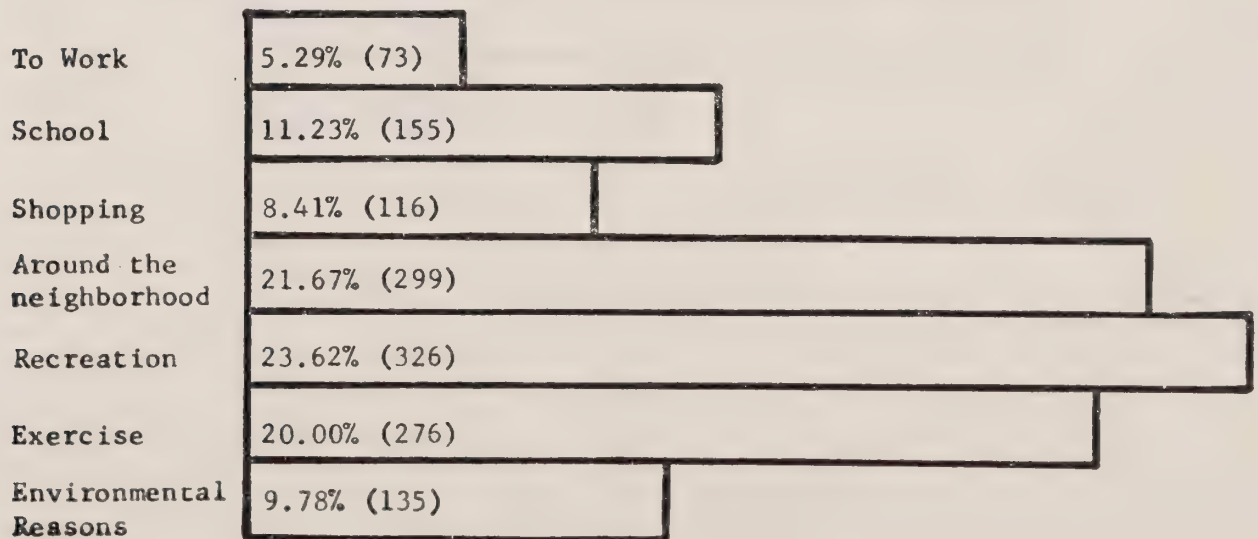
2. What type of bikes are those in question No. 1?



3. Do you plan to increase the number of bicycles in your household in the near future?



4. Where are the bicycles most often ridden?



Source: Kern County Planning Department

5. When do you and/or other members of your household usually ride?

Weekdays	33.33% (305)
Saturday	33.88% (310)
Sunday	32.79% (300)

6. During what hours of the day do you and/or other members of your household ride?

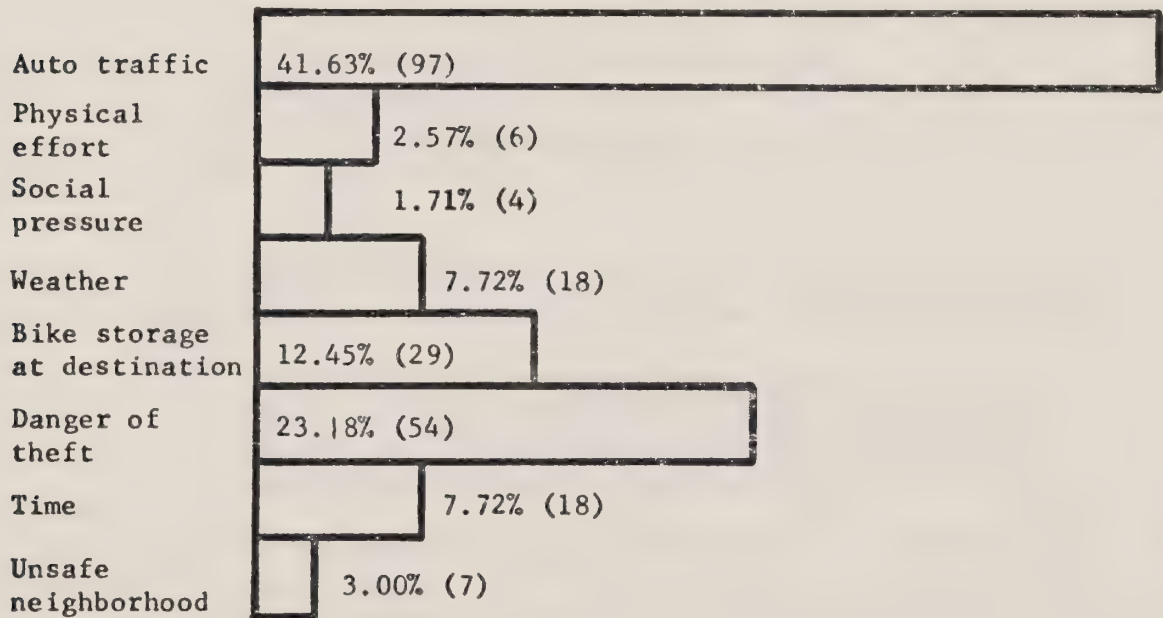
7-9 a.m.	13.99% (144)
9-11	11.47% (121)
11-2 p.m.	15.26% (157)
2-4	23.52% (242)
4-6	23.52% (242)
6-8	11.95% (123)

Source: Kern County Planning Department

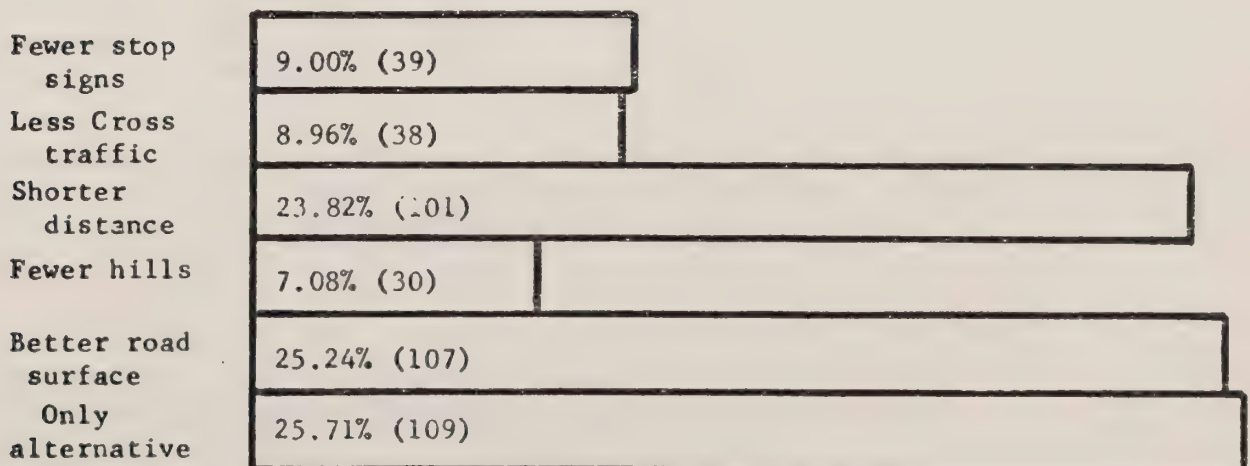
7. What are the most common routes used by the bicyclists in your household?

See Fig. 5, Pg. 18

8. What obstacles do you feel keep people from using bikes more for local transportation and recreation?
(By most extreme obstacle)



9. If you ride your bike along a busy street, what are your reasons for doing so?



10. If provisions were made for safer bicycling such as marked or separated routes and parking facilities at your destination:

Would you use your bike more:

Yes	98.51% (199)
No	1.49% (3)

Would you start using it if you don't now?

Yes	96.67% (87)
No	3.33% (3)

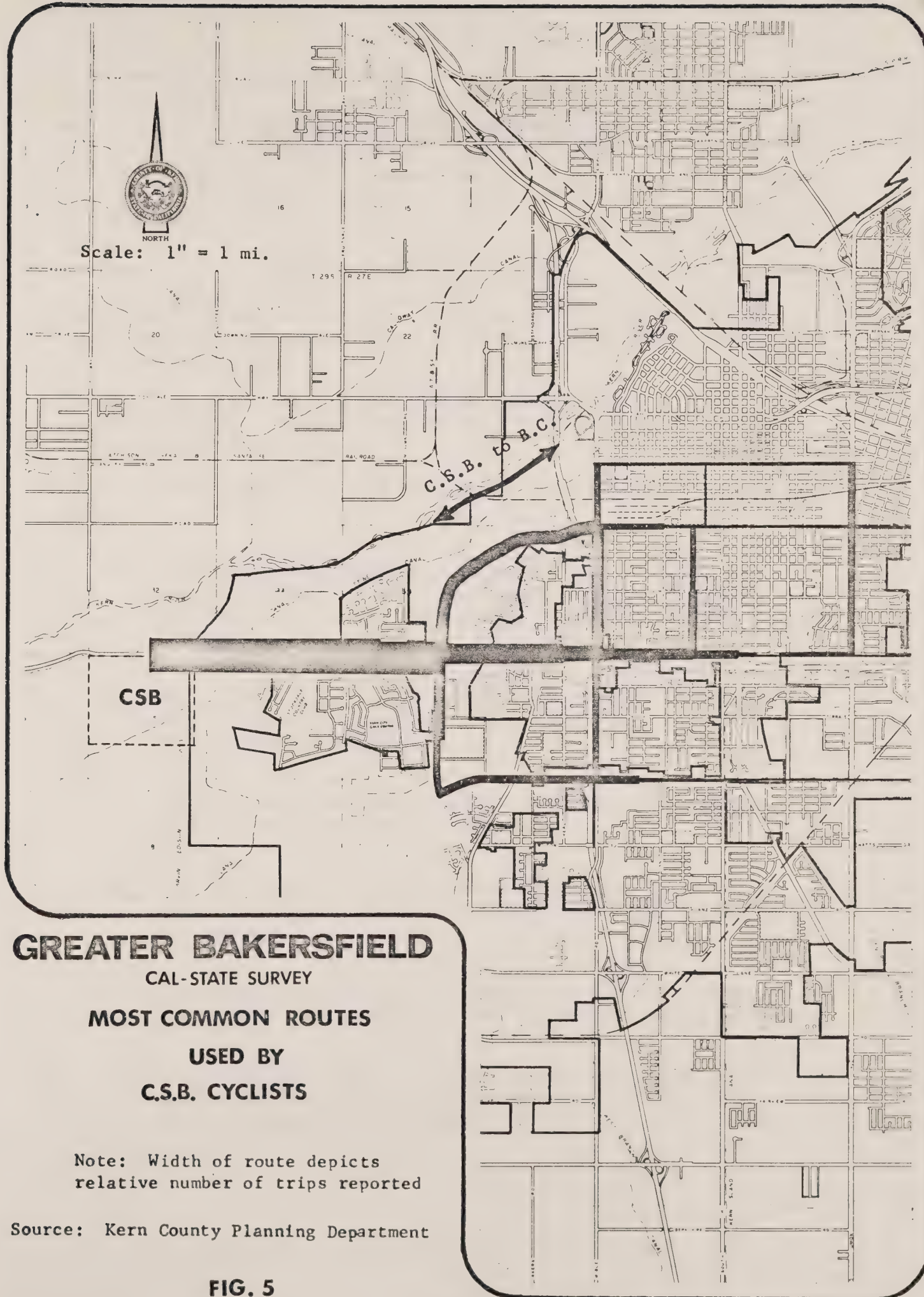
11. What streets do you believe would be most logical and useful for the bike routes mentioned in question No. 10?

The streets most frequently mentioned in the Cal State Survey are listed below (portions of these streets run through incorporated areas which are not within the County's jurisdiction).

Brundage/Stockdale	41.4% (128)
California Ave.	12.9% (40)
Oak St./Wible Rd.	6.7% (21)
Ming Ave.	6.4% (20)
Kern River Bank	4.2% (13)

Other routes mentioned: Chester Ave.; H Street; Union Ave.; Columbus Ave.; Niles Street; New Stine; Real Rd.; University Ave.; Rosedale Hwy; Oleander Ave.

Source: Kern County Planning Department



ASSUMPTIONS

Certain assumptions must be made before a plan of this type can be justified. Unless we assume that the public will benefit from the preparation and implementation of this plan, expenditure of public funds is unwarranted.

In addition to the basic premise that a Bikeways Master Plan is indeed justified, certain postulates must be identified to be used in the formulation of the plan.

The following assumptions were used during the preparation of this plan:

1. The present "fuel shortage" will continue - causing even greater increases in the cost of gasoline, thus decreasing the use of the private automobile for trips of limited distance.
2. Air pollution will remain a critical environmental problem - forcing greater utilization of a transportation mode having a low emission potential.
3. Inflation will continue - making a low-cost transportation mode not only attractive but necessary.
4. The bicycle will enjoy even wider acceptance, and will eventually attain general recognition as a valid transportation mode.
5. As with most other intensely used modes of transportation, the bicycle will require, to some degree, its own facilities.
6. A well designed system of bicycle paths, lanes, and routes, is the most feasible method of satisfying the need for a bicycle transportation network.

7. Bikeway system planning should proceed well beyond thoughts of uni-modal bicycle utilization. Provisions should be made for routes to and from mode transition points, and for adequate storage facilities for bicycles and/or automobiles at those points.
8. Bicycle riders will only choose a bikeway over a conventional street when the bikeway can offer greater safety, convenience and/or aesthetic quality.
9. Bicycles will become even more popular with adults and will continue to be used extensively by children.
10. If a well designed bikeway system is implemented in Kern County, it will receive general public acceptance and substantial use.

"A comparison of the time-distance trade-off between bicycle and automobile commuting under conditions that are believed to be typical shows that a bike may be directly competitive with an automobile on a strict time-of-travel basis for distances of from one to four miles."

James P. Hamill
Director of Planning
Applications, Pan-Technology
Consulting Corporation
Washington, D. C.

TYPES OF CYCLING

There are four basic types of cycling which enjoy general acceptance in the United States. They are:

- Neighborhood
- Commuter
- Recreational
- Sport

The following are definitions of each of these four basic types, and an explanation of the extent to which this Plan deals with them.

NEIGHBORHOOD

This type of cycling includes any trip which occurs primarily on local streets within a short distance of the residence of the rider. This type of trip is typified by a child riding to a nearby friend's house or neighborhood park. Also included within this category would be short shopping trips to the neighborhood store or nearby shopping center.

This type of cycling is the most difficult for which to provide bikeways. Routes are so diverse that virtually every street would need to be designated as a bikeway in order to provide a comprehensive system.

Since auto travel on local streets is generally slower than on collectors or arterials, and since auto drivers are typically more cautious on these streets, neighborhood cycling can usually be pursued, without any special facilities, in relative safety.

Although the need for bikeways may not be as critical in the residential neighborhood as elsewhere, a concerted effort should be made in new subdivisions to provide for links to the major commuter and recreational bikeways.

COMMUTER

This type of cycling is exemplified by a person riding from his home to his place of employment. Trips usually take the rider out of his neighborhood to some major traffic generator such as a business district,

shopping area or school. Commuter trips are generally the most utilitarian of all bicycle trips, always with a definite purpose of getting from one place to another. Since time is usually of the essence in this type of riding, routes should be as direct as possible, and because business districts, shopping areas, schools, etc., attract large numbers of people, routes should be designed to accommodate a concentration of cyclists.

At locations where a large number of commuter trips terminate, an effort should be made to provide safe bicycle parking or storage facilities. Normally, commuter trips are confined to urbanized areas and trips are relatively short. (Average is about 3 miles.) If, however, the commuters of Kern County, who live in outlying areas, decide they would like an alternative to their private auto, it is possible for buses serving these areas to provide for on-board transport of bicycles. This would require coordination with the local transit district.

Because commuter trips are usually made during hours of peak traffic and along heavily traveled routes, they can be extremely dangerous. Therefore, commuter bikeways should be as separated from automobile traffic as possible, while still following direct commuter corridors.

RECREATIONAL

Recreational bikeways are perhaps what most people think of when the subject of bicycle "trails" or "paths" is mentioned. Recreational bicycling is becoming a very popular American pastime. It is one of the few leisure time activities in which families can participate as a unit. This type of cycling is practiced for many reasons, most of which are directly related to the intrinsic attributes of cycling in general.

Cycling provides an enjoyable way to maintain personal physical fitness. It allows direct access to many places inaccessible by automobile. Bicycling gives the rider a general sense of well being - knowing that he is more or less self-sufficient for power and knowing that he is pursuing a form of recreation which does not add to air or noise pollution.

Recreational bikeways should be planned to provide their users the most scenic routes possible, and ideally, should be totally separated from automobile traffic.

Because recreational bikeways may be of considerable length, some facilities may be needed along their routes to better serve the public.

Said facilities should be located so as to best serve the public as a whole. Where a small rest stop is required along a recreational bikeway, it should be equipped with restrooms, picnic tables, water fountains and a small parking lot. The rest stop should be located in a manner which will allow not only access from the bikeway but automobile access as well.

Because recreational bikeways should ideally traverse areas of high scenic quality, their location may not be centrally located within population centers. This fact will necessitate the creation of bikeways for the purpose of linking areas of high recreational trip generation with recreational bikeways. Hopefully, a bikeway system can be implemented which will create a network on which a rider can get to within a reasonable distance of any destination, within the system, without having to leave some type of bikeway.

Because of the nature of recreational bikeways, they should be constructed so as to alter the natural landscape as little as possible. Care should be taken, when precise alignments are being chosen, to select those alignments which will provide the best route, while minimizing grading and clearing of vegetation.

SPORT

In many instances, sport cycling can be pursued on facilities usually associated with other types of cycling. It differs, however, from other types of cycling in that some degree of competition is almost always involved.

Generally, sport cycling is characterized by relatively high rates of speed, longer distances, and more experienced riders, than in other types of cycling. In some areas, bicycle raceways (velodromes) have been constructed to provide for specialized competitive bicycle events. Although no such race facility is proposed by this plan, a velodrome may be justified in the future if public demand for such a track is sizeable. At that time, thought should be given to making the race track a multi-purpose facility -- possibly providing a football or soccer field inside an oval track.

Cross-country sporting events are also popular. Recreational bikeways are well suited for this type of event after minimum preparations have been made. Local bicycle clubs will undoubtedly utilize Kern bikeways for this purpose.

It should be clear that although no specialized facilities are being proposed at this time for competitive bicycling events, other proposed bikeways should satisfactorily serve for most sport bicycling until such time as a track is warranted.

TYPES OF BIKEWAYS

Many different words are used to describe bicycle facilities. The term bikeway is used in this text to refer to all facilities that are specifically designated for non-motorized bicycle travel.

There are basically three types of bikeways proposed for use in Kern County. For the purposes of this Plan, they will be labeled bikepaths, bikelanes, and bikeroutes. It should be understood, however, that there are many terms in common use which are synonymous with these.

The following are general definitions of these three basic bikeways types:

BIKEPATH

A bikepath is a specific right-of-way for the exclusive use of bicycles. Conflicts at grade with other activities are kept at a minimum. Bikepaths are the most desirable form of bikeways. They provide for the safest riding conditions and tend to be more pleasing aesthetically. At present, they are the most practical for recreational bikeways, in Kern County. However, if commuter cycling becomes widespread, it may be feasible to construct commuter bikepaths.

Potential locations for bikepaths are:

1. Within public parks or open spaces;
2. Along abandoned railroad rights-of-way;
3. Beside flood control channels, canals, river banks, and lakes;
4. Along transmission line easements;
5. Within abandoned street and highway rights-of-way;
6. In conjunction with new development.

BIKELANE

A bikelane can be defined as a restricted right-of-way specified for the preferential use of bicycles. Bikelanes are usually developed within the

cross section of a road right-of-way. One or more lanes or portions thereof are marked for bicycle use by a painted stripe or raised berm.

Although bikelanes are not as safe as bikepaths, they do offer the bicycle rider a designated portion of the road right-of-way, and thus reduce mode conflicts.

Bikelanes are less expensive than bikepaths but may require the elimination of some street-side parking. An effort should be made during route design to eliminate as little parking as possible while providing maximum safety to both bicycle and auto operators.

This type of bikeway is often most feasible for commuter routes, since commuter trips are typically accomplished on traffic arteries having a relatively low incidence of street-side parking.

BIKEROUTE

Bikeroutes are generally the most prevalent type of bikeway in California - not because they are best, but because they are the least expensive and easiest to implement. They are often called shared bikeways because they normally share a road right-of-way with automobiles. Bikeroutes are marked only by "Bike Route" signs and offer the least amount of protection from automobile traffic.

While it is most desirable to avoid mixing bicycles with pedestrians or motor vehicles, it is recognized that in certain instances, this will be the most practical means of developing a bikeway and, in some cases, may be warranted. Shared facilities are acceptable as long as it is possible to provide a degree of safety that is acceptable to the cyclist and to the motorist. In cases where this is not possible, bikepaths or bikelanes should be provided.

A "Bike Route" sign implies conditions of a reasonable degree of safety available to cyclists. Since bikeroutes consist merely of signing, it should be kept in mind that signing alone will not assure safety. There should be adequate width in the outside lane of the roadway to provide for operation of bicycles and motor vehicles. Bikeroutes should only be developed on routes with low speed, low volume roadways, such as residential streets.

GOALS AND POLICIES

GOAL 1

Encourage the development of a well planned bikeways system throughout Kern County.

POLICIES

1. Amend the County Subdivision Ordinance to require developers of future subdivisions to dedicate and improve planned bicycle paths in accordance with the provisions of this plan.
2. Utilize available state and federal funds and grants for acquisition and construction of bicycle routes.
3. Utilize existing and abandoned public and utility rights-of-way and easements, where possible, for construction of bicycle routes.
4. Utilize public property such as flood control channels, parks and appropriate existing road rights-of-way, where possible, for construction of bicycle routes.
5. Promote citizen participation for the promotion, acquisition and construction of bicycle routes.
6. Actively seek new means for the acquisition and construction of bicycle routes.
7. Encourage incorporated cities within the County to adopt and implement the provisions of this plan as an element of their respective general plans.

"Systematic and practical working guidelines are essential to local leadership in communities having an interest in approaching the full range of bicycle-related issues in a coherent and comprehensive manner."

James P. Hamill
Director of Planning
Applications, Pan-Technology
Consulting Corporation
Washington, D. C.

GOAL 2

Provide a bikeway system with a high degree of continuity, affording safe and convenient county-wide accessibility.

POLICIES

1. Locate bicycle routes along scenic corridors, wherever possible.
2. Connect cultural facilities, recreation areas, shopping areas, and educational facilities with bicycle routes.
3. Separate bicycle and automobile traffic whenever economically and physically possible.
4. Provide bicycle commuter routes along the safest and most direct routes to employment centers.
5. Require bicycle routes as an integral part of appropriate subdivisions and planned residential developments, with connections to recreational and commuter routes.
6. Locate access points to recreational bikeways in convenient locations with automobile parking facilities for those driving to these areas.
7. Responsible agencies should consider bikeway needs whenever road, sidewalk, bridge, underpass, major utility lines, and similar projects are to be undertaken.
8. Provide a phasing program for implementation, with priority given to routes with potentially large usage.
9. Encourage coordination and development of inter-jurisdictional bicycle routes. (Inter-city, city-county, county-county, county-state)

GOAL 3

Provide the related facilities and services necessary to allow bicycle travel to assume a significant role as a form of local transportation and recreation.

POLICIES

1. Provide bicycle parking facilities at all major shopping, cultural, employment, educational, and recreational centers. These facilities should include lockable racks.
2. Construct restrooms, picnic tables, and related appurtenances to serve users of bikeways and other recreational facilities.
3. Provide appropriate signing, signals, lighting, etc., to ensure the highest level of safety and convenience for both the bicyclists and the auto driver.
4. Devise and promote an effective maintenance system for bike-ways and related facilities.

GOAL 4

Provide for the protection and enhancement of the environment with bikeways.

POLICIES

1. Encourage wide use of the bicycle as a means to reduce air pollution and traffic congestion as well as a method to achieve better public health.
2. Provide for well designed bicycle routes which protect existing environmental attributes and enhance less aesthetically pleasing areas with landscaping.

BIKEWAY DESIGN CHARACTERISTICS STANDARDS AND MITIGATION MEASURES

Several characteristics of the bikeway must be specified if it is to be rationally designed. These include the design speed of the facility, the space required by the bicycle and cyclist, minimum widths and clearances, grade, radius of curvature, bikeway surface, drainage, etc. Each of these characteristics is discussed below. Included in this discussion are design standards and proposed methods for the mitigation of anticipated problems.

DESIGN SPEED

The speed that a cyclist travels is dependent upon several factors which include the type of bicycle used and its gearing, the grade and surface condition of the traveled way, the direction and magnitude of the wind, and the physical condition of the bicyclist. Although bicycles are capable of speeds in excess of 30 miles per hour (mph), most riders seldom exceed 15 mph. Therefore, this plan proposes a design speed of 15 mph for urban bikelanes over level ground and 20 mph for bikepaths in urban areas. These standards should be adjusted when designing bikeway sections of sufficient up or down grade to affect the speed capability of the rider.

Relative speed of bicyclists as opposed to motor vehicles and pedestrians is an important consideration in bikeway design. As the speed differential increases, so does the potential for mode conflicts and, thus, accidents. This is a major factor supporting separated bikepaths over other types.

Obviously, separated paths are not feasible in every case, and bikelanes and bikeroutes will have to be utilized. In these instances, care should be taken to insure the least number of conflicts arise.

SPATIAL REQUIREMENTS

Properly designed bikeways must be dimensioned so as to provide for safe and comfortable bicycling, as well as allow maintenance with available equipment.

Bicyclists have two types of spatial requirements--physical and psychological. Of these, the physical requirements are the easier to measure.

The average dimensions of a bicycle and cyclist pertinent to minimum bikeway width specifications and those employed in European design are:

Handle bar width	1.96 feet	(0.6 m)
Cycle length	5.75 feet	(1.75 m)
Pedal clearance	0.5 feet	(0.15 m)
Vertical space occupied by cycle/cyclist	7.4 feet	(2.5 m)

Taking into consideration the minimum dimensions of European bikeways, suggested minimums by the State of California Business and Transportation Agency, dimensions of available maintenance machinery, and psychological factors, the following minimum standards for the physical design of bikeways in Kern County are suggested.

MINIMUM DIMENSIONS TO BE USED AS STANDARDS FOR THE DESIGN OF KERN COUNTY BIKEWAYS

BIKEPATHS See figure (6)

Width of Paving

One way, one lane	6 feet
Two way, one lane each way	8 feet

Lateral Clearance to Static Obstructions

One way, one lane	1 foot
Two way, one lane each way	1.5 feet

	Vertical Clearance to Static Obstructions
One way, one lane	1 foot
Two way, one lane each way	1 foot

BIKELANE

LOCAL STREETS See Fig. 7

	Width
Road right-of-way	60 feet
Bikelane	8 feet

HIGHWAY SECTIONS HAVING FEW INTERSECTIONS AND/OR ACCESS POINTS

MAJOR HIGHWAY See Fig. 8

	Width
Road right-of-way	110 feet
Bikelane	6 feet
Divider (landscaped)	4 feet

SECONDARY HIGHWAY See Fig. 9

	Width
Road right-of-way	90 feet
Bikelane	6 feet
Divider (landscaped)	4 feet

HIGHWAY SECTIONS HAVING MANY INTERSECTIONS AND/OR ACCESS POINTS

MAJOR HIGHWAY See Fig. 10

	Width
Road right-of-way	110 feet
Bikelane	8 feet

SECONDARY HIGHWAY See Fig. 11

	Width
Road right-of-way	90 feet
Bikelane	8 feet

RURAL HIGHWAYS

See Fig. 12

	Major	Secondary
Road right-of-way	110 feet	90 feet
Bikelane	10 feet	10 feet

Note: The criteria to be used in determining the most effective application to each of the above bikeway types are discussed on Pages 52-54.

GRADE

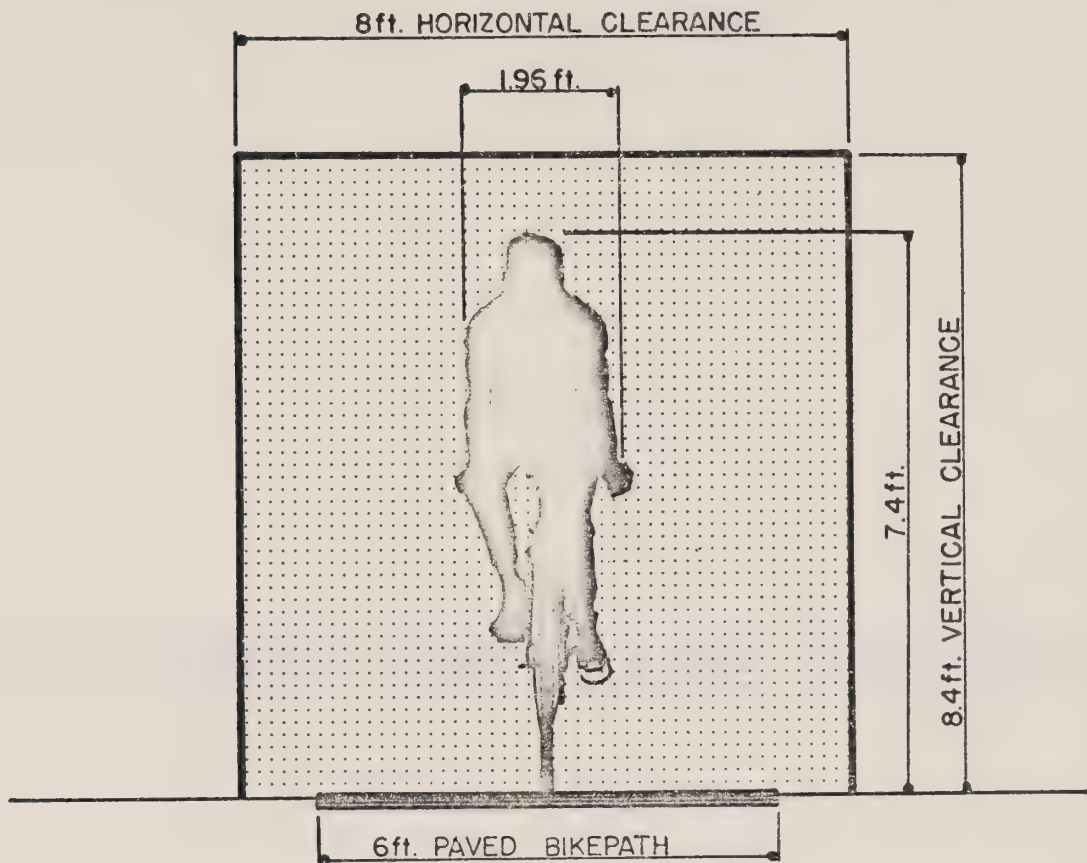
One of the principal determinants of bikeway usage is the grade of the bikeway. Generally, bikeways designed with lesser maximum grades will receive more use. Equally as important as grade steepness is the length of the grade section. Several short grades of 5% or 6% are preferable to one long grade of 4%. However, grades of 1.5% or less may be used without restriction, since most bicyclists can maintain this grade for a prolonged period of time.

Intensive grade studies are most important when designing bikepaths. The grades of bikelanes and bikeroutes are almost always predetermined by the road right-of-way of which they are a part. Grade should be considered, however, when choosing which road rights-of-way are to be used for bikelanes and bike-routes.

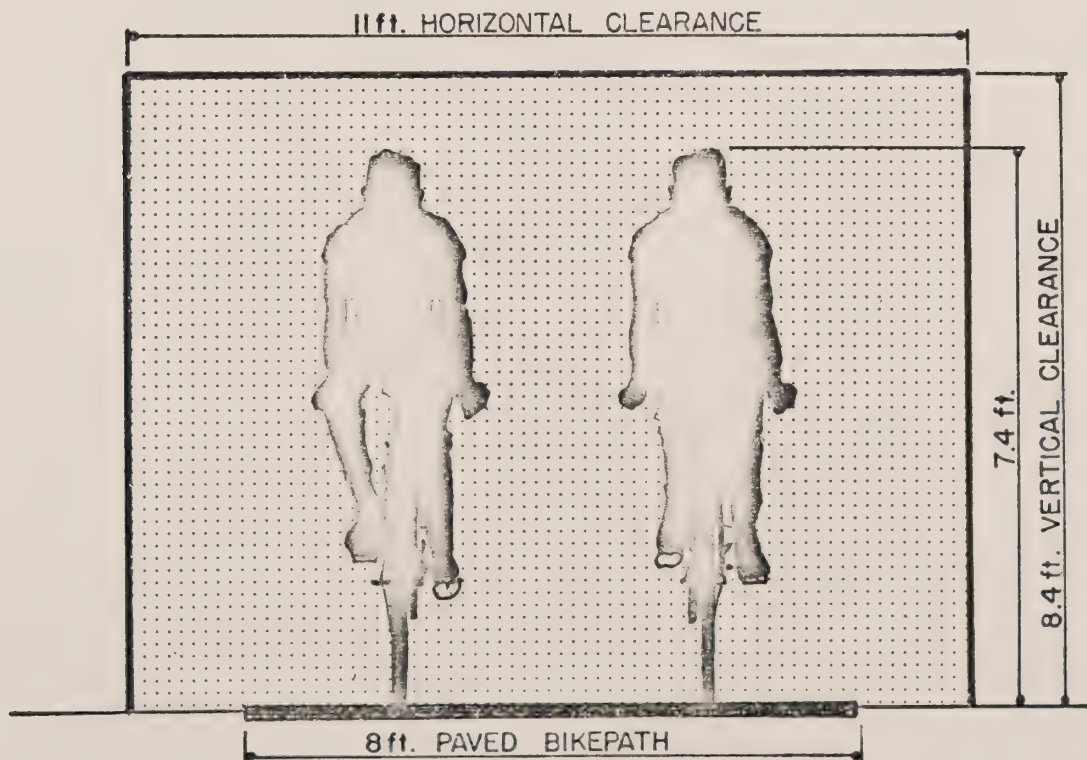
This plan suggests that the maximum grade for Kern County bike-ways should be held to 5% except for short distances on bike-paths where steeper grades may be necessary to achieve a highly desired location. Even on bikepaths with grades of less than 5%, rest stops are suggested to allow exhausted riders room to get out of the path of others.

FIG. 6

MINIMUM DIMENSIONS FOR THE DESIGN OF BIKEPATHS



— ONE WAY (ONE LANE) BIKEPATH —



— TWO WAY (ONE LANE EACH WAY) BIKEPATH —

Source: Kern County Planning Department based on information from Bibliography - Ref. #6

PROPOSED BIKELANE DESIGNS

LOCAL STREET ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

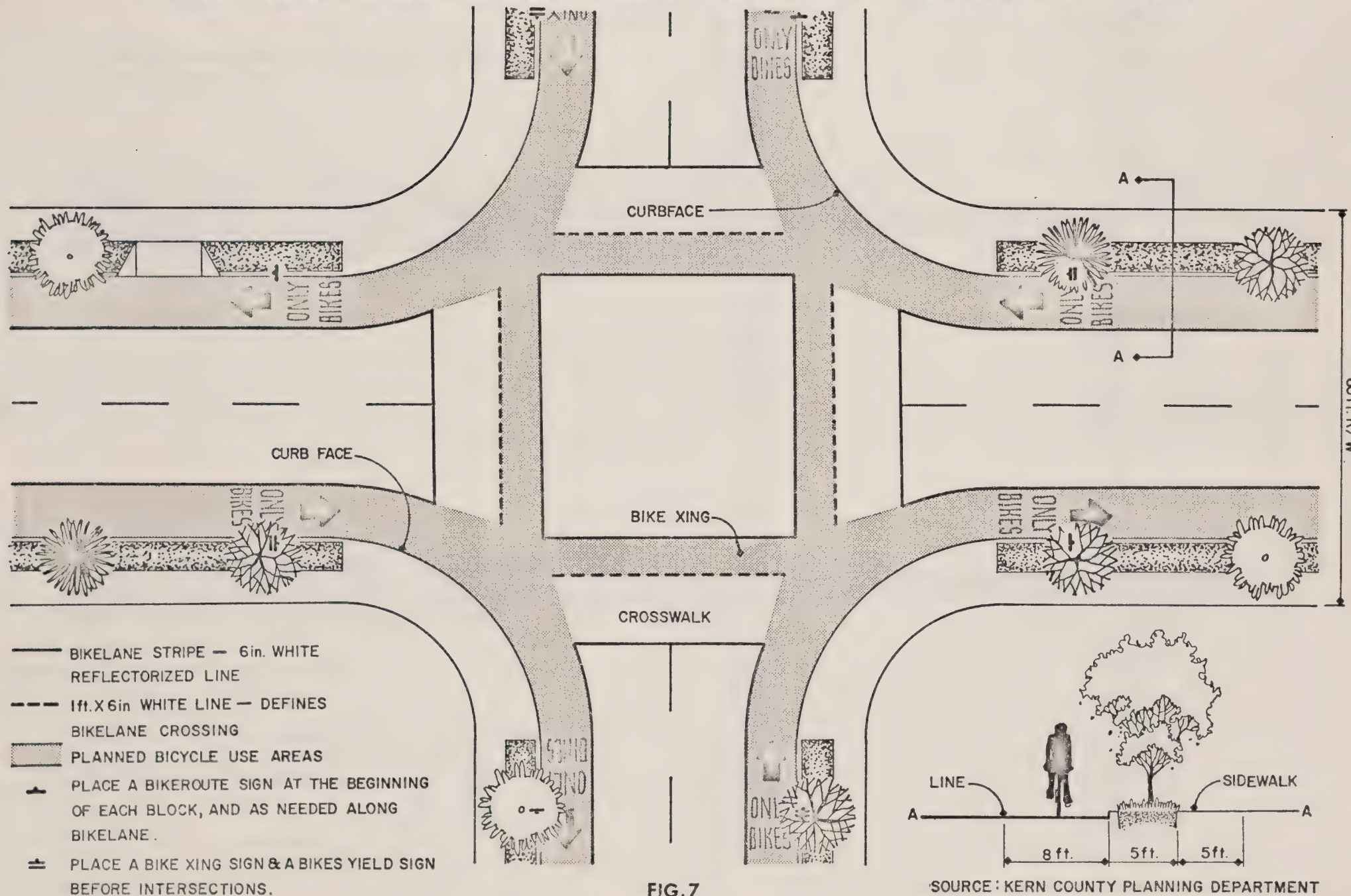
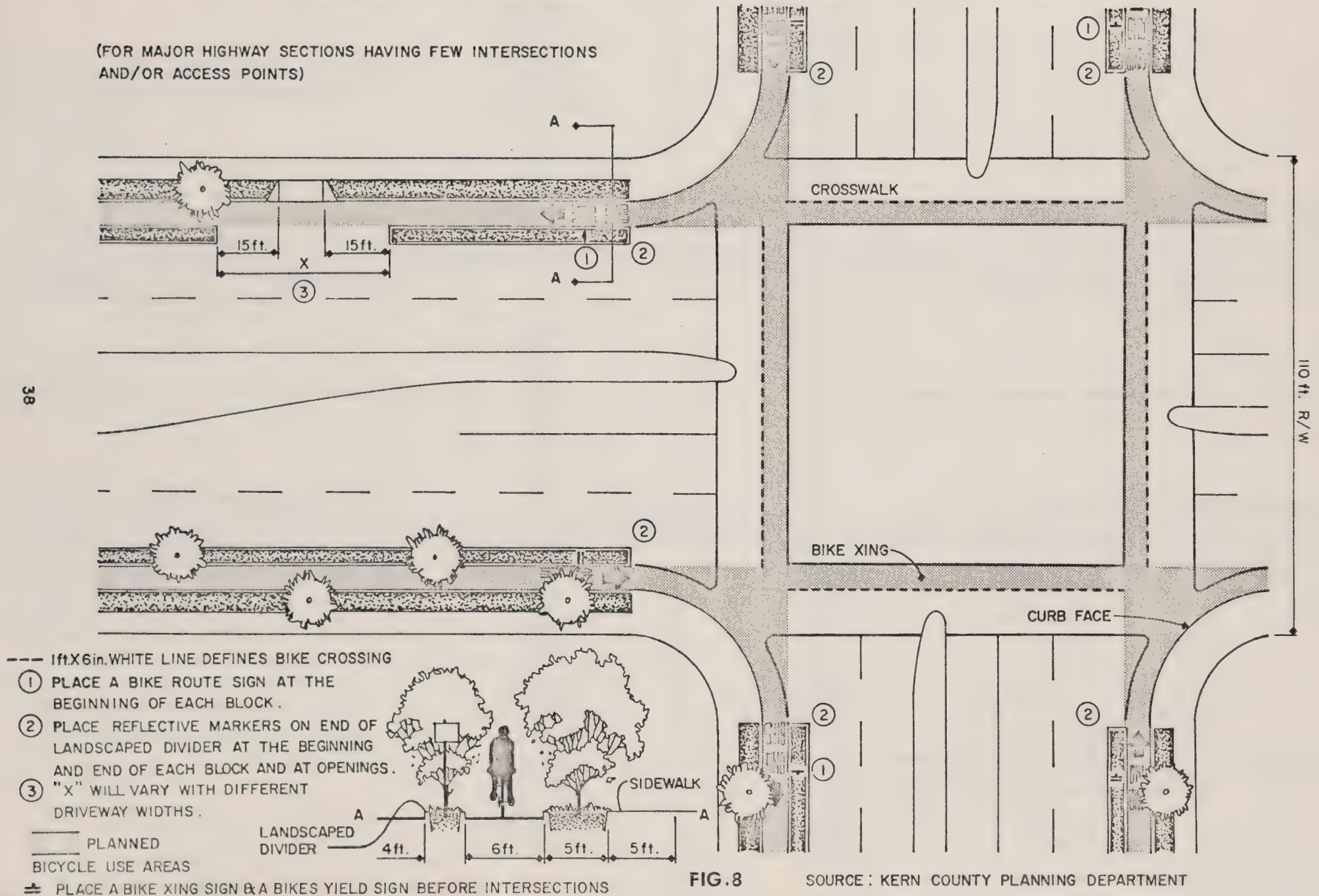


FIG.7

SOURCE : KERN COUNTY PLANNING DEPARTMENT

MAJOR HIGHWAY ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

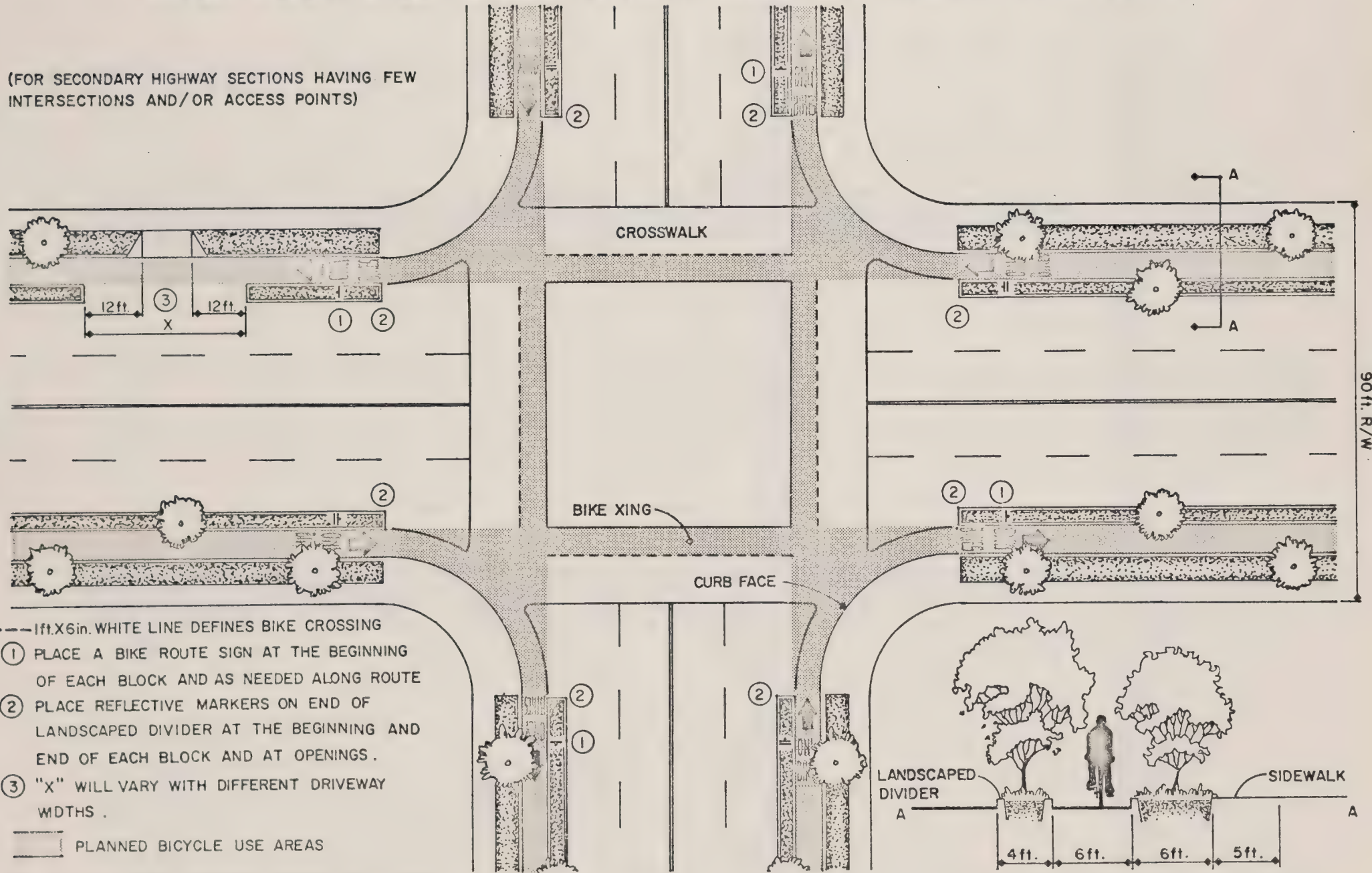
(FOR MAJOR HIGHWAY SECTIONS HAVING FEW INTERSECTIONS
AND/OR ACCESS POINTS)



SECONDARY HIGHWAY

ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

(FOR SECONDARY HIGHWAY SECTIONS HAVING FEW INTERSECTIONS AND/OR ACCESS POINTS)



- 1ft. X 6in. WHITE LINE DEFINES BIKE CROSSING
- ① PLACE A BIKE ROUTE SIGN AT THE BEGINNING OF EACH BLOCK AND AS NEEDED ALONG ROUTE
- ② PLACE REFLECTIVE MARKERS ON END OF LANDSCAPED DIVIDER AT THE BEGINNING AND END OF EACH BLOCK AND AT OPENINGS.
- ③ "X" WILL VARY WITH DIFFERENT DRIVEWAY WIDTHS.

PLANNED BICYCLE USE AREAS

PLACE A BIKE XING SIGN & A BIKES YIELD SIGN BEFORE INTERSECTIONS

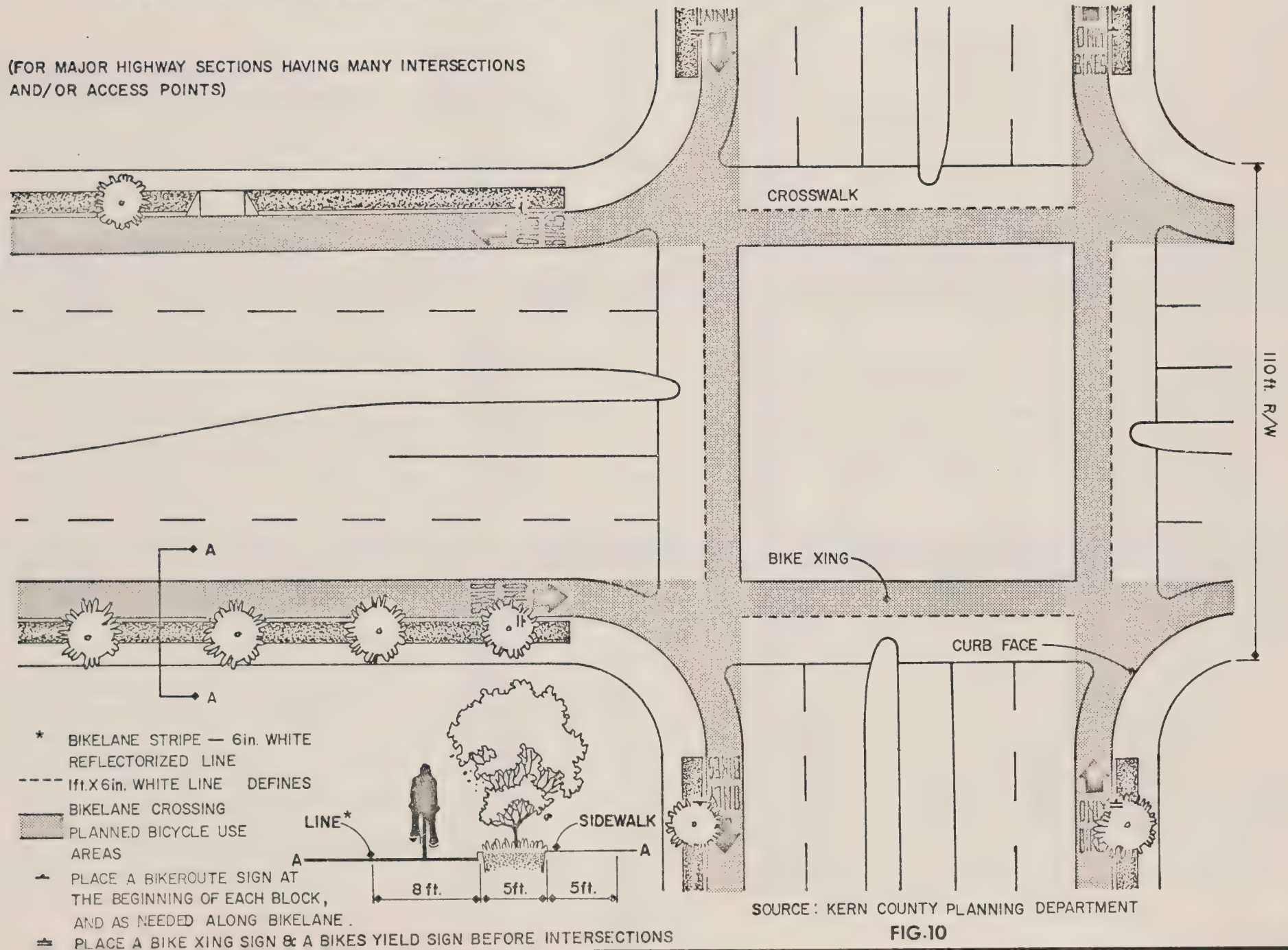
FIG.9

SOURCE : KERN COUNTY PLANNING DEPARTMENT

MAJOR HIGHWAY

ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

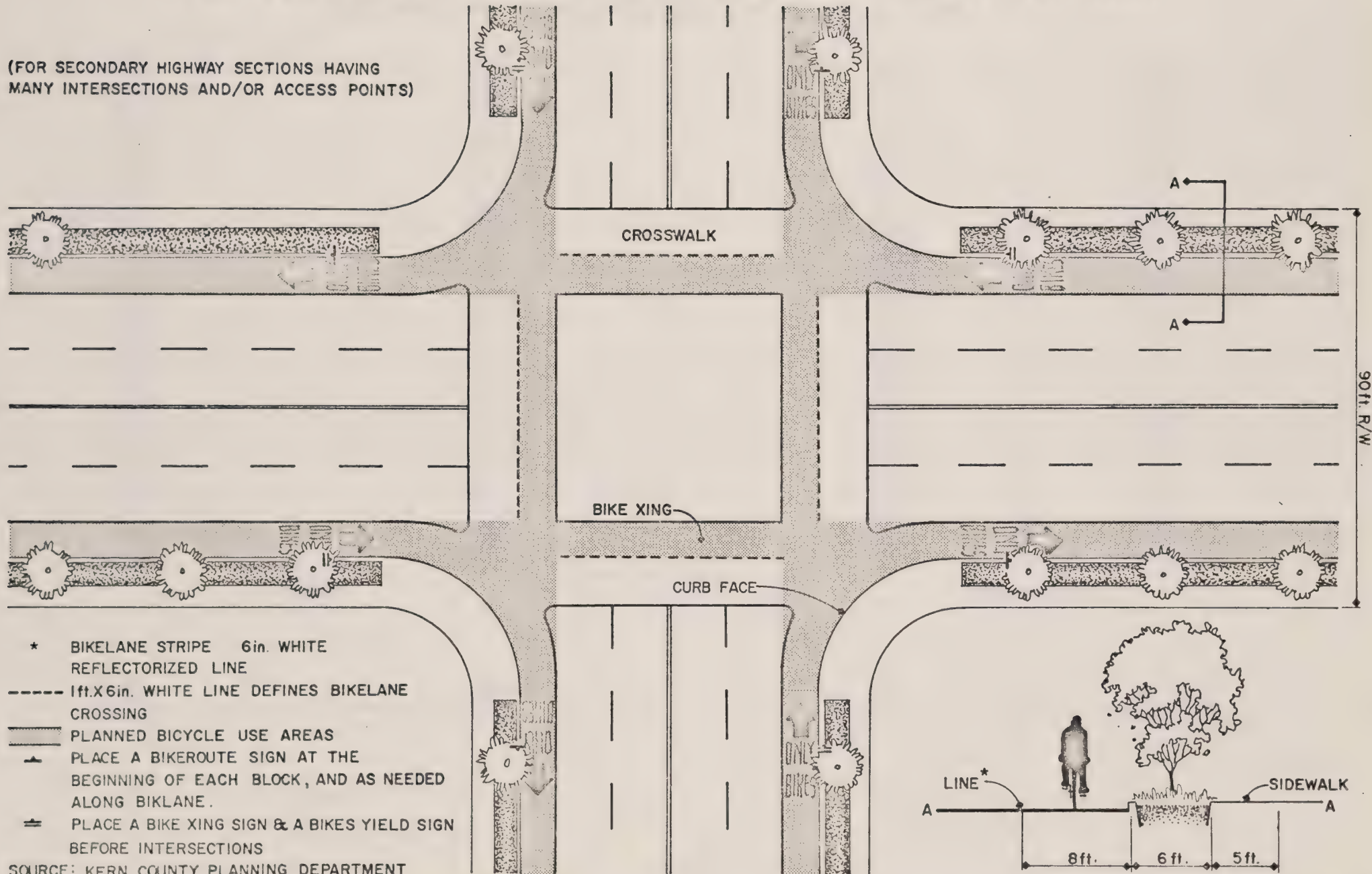
(FOR MAJOR HIGHWAY SECTIONS HAVING MANY INTERSECTIONS AND/OR ACCESS POINTS)



SECONDARY HIGHWAY

ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

(FOR SECONDARY HIGHWAY SECTIONS HAVING MANY INTERSECTIONS AND/OR ACCESS POINTS)



SOURCE: KERN COUNTY PLANNING DEPARTMENT

FIG. 11

RURAL MAJOR AND SECONDARY HIGHWAYS

ONE WAY, ONE LANE EACH SIDE OF RIGHT-OF-WAY

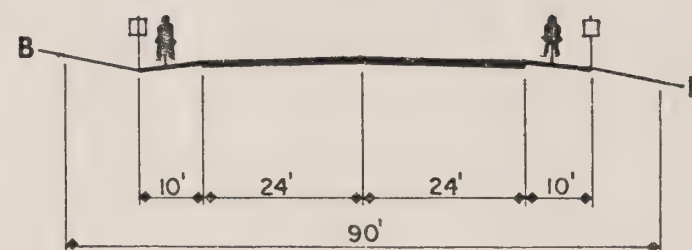
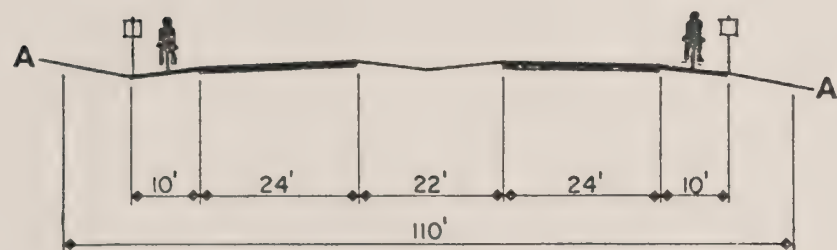
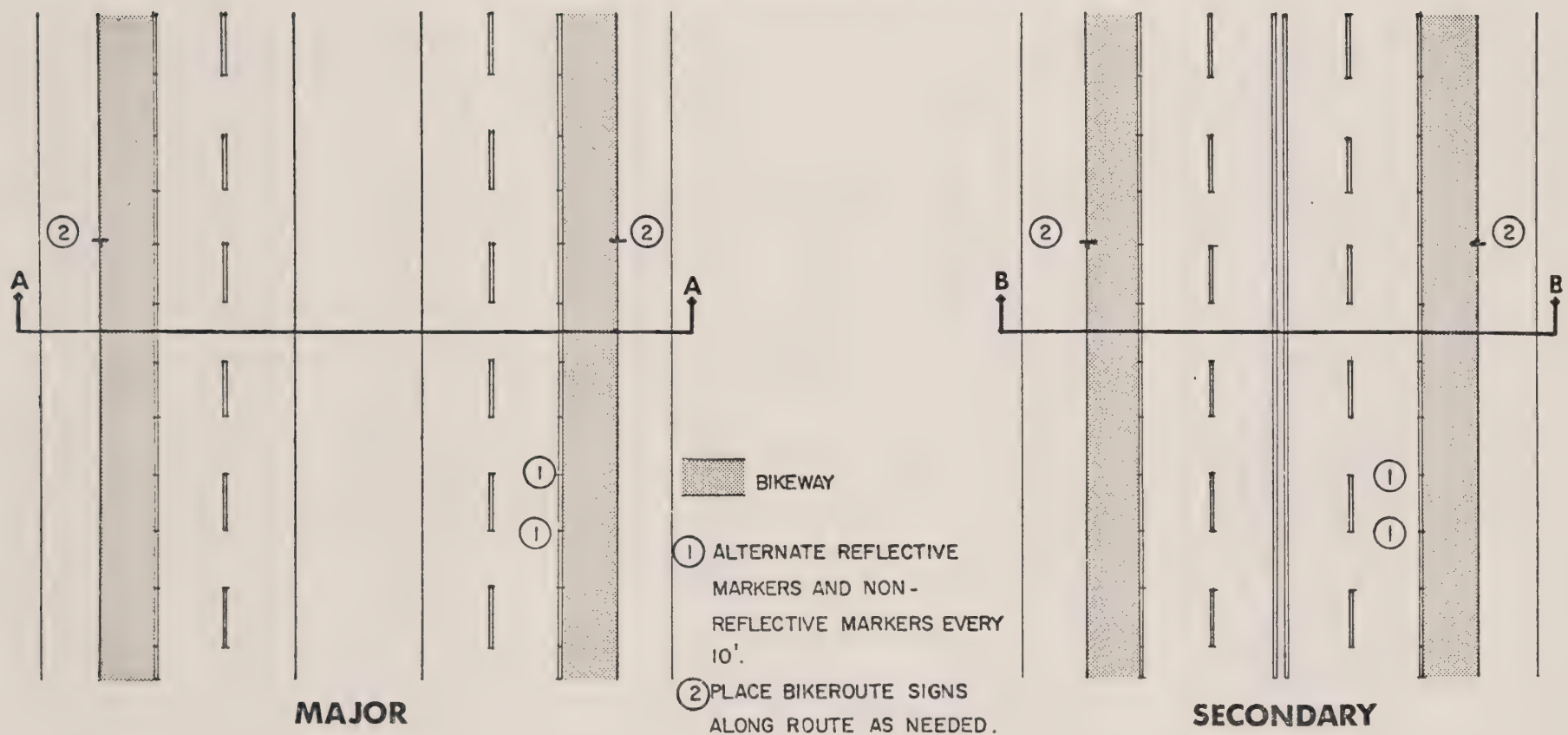


FIG.12

SOURCE: KERN COUNTY PLANNING DEPARTMENT

RADIUS OF CURVATURE

Bikelanes and bikeroutes will generally have curvatures dictated by existing road alignments. Since these curvatures are designed to accommodate motor vehicles, they should be more than adequate for cyclists. However, whenever the expected or actual speed of cyclists exceeds the available radius of curvature, signs should be employed to warn cyclists or regulate bicycle speeds, in the interest of safety. Such situations may occur on downgrades where bicycles may achieve unsafe speeds.

When designing bikepaths, it is often possible to obtain any desired radius of curvature. Section 7-1000 of the State Highway Design Manual proposes the following radii of curvature for the indicated design speeds, assuming a super elevation of .02 ft./ft.

Design Speed (mph)	Minimum Radius (ft.)
10	15
15	35
20	65
25	100
30	140

These radii should be used when designating bikepaths. Also, the State suggests that curves with radii less than 100 feet be widened one foot on the inside for each 25° of central angle, up to a maximum of four feet of widening.

SURFACE

Bikelanes and bikeroutes, by definition, will require no special surfacing when constructed along existing streets and highways. However, where these facilities are planned for new streets, care should be taken to insure proper surfacing, at least in accordance with the following standards for bikepath construction.

Bikepaths must be capable of supporting maintenance vehicle loads as well as bicycles. Therefore, careful consideration must be given to selecting the proper surface treatment for each planned bikepath.

Although many materials have been used for bikeway construction, it is generally accepted today that asphalt surfacing is the most feasible in a majority of situations.

RECOMMENDED BIKEWAY THICKNESS FOR FULL DEPTH HOT-MIX A.C. ON VARIOUS SUB-GRADES

SOURCE: "EFFECTIVE DESIGN FOR BICYCLE PATHS,"
PAVING FORUM, APRIL, 1966, P. 7: NATIONAL ASPHALT PAVING ASSOCIATION

QUALITY OF EXISTING SUB-GRADE	MATERIAL (AASHO SYSTEM)	TOTAL THICKNESS (INCHES)
Very good	Gravels and sandy gravels: A-1, A-2-4, A-2-5, A-2-6	3
Good	Silts and clays: A-4, A-5, A-6, A-7-5, A-7-6	4
Poor*	Silts and clays: A-4, A-5, A-6, A-7-5, A-7-6	6

*Silts and clays rate poor only under the following conditions:

1. when they occur in low lying areas with poor natural drainage.
2. where conditions of the water table and climate are such that severe frost heave can be expected.
3. where high percentages of mica-like fragments or diatomaceous particles produce a highly elastic condition.
4. where it is desired to "bury" highly expansive soils deeper in the section to limit the effects of seasonal variations in moisture.

Figure 13

The following recommendations from the National Asphalt Pavement Association (NAPA) and the Institute of Transportation and Traffic Engineering, School of Engineering and Applied Science, University of California Los Angeles, should be used when decisions regarding surfacing of Kern County bikepaths are being made.

In NAPA's "Effective Design for Bicycle Paths," the use of full-depth hot-mix asphalt pavement laid directly on the subgrade is recommended. The total thickness to be used depends upon the quality of the subgrade and is summarized in Figure (13). It is suggested that regular highway mixes can be used provided they are dense graded (10% air voids). The surface course should be a fine mix (100% passing the 1/2" screen or finer) to provide a smooth texture. Asphalt content should be 1/2% higher than that used for roads, since the bikeway will be subject to lighter loadings than would a typical motor vehicle roadway.

Another acceptable bikeway structural section when good drainage exists along the whole length of the bikeway consists of placing a 3" to 4" aggregate base of gravel, crushed stone, or slag on the subgrade and laying a 1 1/2" to 2" asphalt surface course over the base. This method is a more typical practice than the full-depth hot-mix method and offers cost savings, particularly when the bikeway is placed on a poor quality subgrade.

This plan proposes that the minimum width of a one-way bike-path be kept to six feet. This minimum is to insure access for maintenance vehicles. This six-foot minimum may not be sufficient to provide for asphalt spreading equipment, however. Therefore, a study should be made prior to the final design of each bikepath in order to determine if a wider path could be constructed at a lesser cost, remembering the difference in land acquisition costs.

DRAINAGE

Proper drainage of bikeways presents some unique drainage problems. None of these problems, however, are beyond remedy. The following are suggested methods by which proper drainage may be achieved for each bikeway type.

BIKEPATHS

Paved bikepaths should be constructed in a manner which will prevent water accumulation on the paths. This is easily accomplished by a slight slope from one side to the other or by crowning. A slope of 1/4" to 3/8" per foot should be sufficient to insure proper runoff. Also, drainage ditches, catch basins, and drains should be provided where needed to protect adjacent lands and prevent erosion.

BIKELANES AND BIKEROUTES

All drainage from bikelanes and bikeroutes will be accepted by existing drainage systems appurtenant to the roadways on which they are located. Provisions must be made, however, to permit runoff water to drain from the roadway through the berm or landscaped divider, proposed as a part of two bikelane designs, into the existing drainage receptacles. This may be accomplished either by periodic openings in said barriers or by drains through the barriers.

GRATE DESIGN

A substantial safety hazard exists where drainage grates made of steel slats running parallel to the curb are still in use. Whenever a grate of this type exists within a bikeway under construction, the grate should be changed to a type shown in Figure (14) or made "bicycle safe" in some other manner.

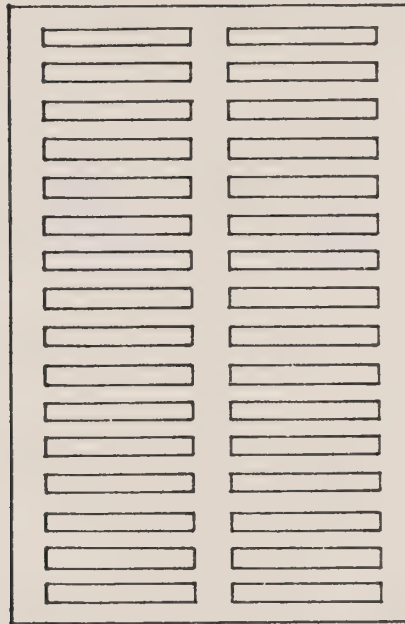
It is the policy of both Kern County and the City of Bakersfield to use curb face drain openings wherever possible in new installations. Therefore, the problem described above should only occur when a bikeway is to be constructed over older drain openings.

INTERSECTION DESIGN

The most effective way to eliminate conflicts between bicyclists and motorists at intersections is to provide grade separated crossings for bideways at these locations. In some cases, the cost of such facilities is preventative. However, grade

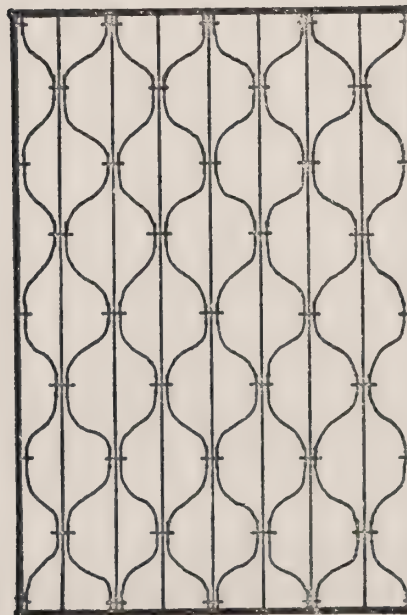
"BIKE-PROOF" DRAINAGE GRATES

FIG. 14



CAST IRON TYPE

RIVETED STEEL TYPE



CURB FACE

The above are schematic representatives of two potential grate designs.

Source: Christy Concrete Products, Inc., 9700 Ave. 256, Tulare, CA.

separated crossings should be considered wherever a bikepath or bikelane crosses the alignment of any of the following:

1. Railroad tracks
2. Freeways
3. Heavily traveled arterials
4. Heavily used pedestrian ways
5. Any location where the common use by bicyclists and any other transportation mode would create a hazardous situation

At intersections where grade separations cannot be justified, a lesser system must be utilized.

The two major auto-bicycle conflict situations which exist at intersections are described below followed by the solution proposed by this plan to help alleviate each of them.

1. When a cyclist wishes to make a left turn from a bike-lane, he must cross in front of auto traffic traveling parallel to him. This move may place the cyclist in a potentially hazardous situation. For this reason, this plan proposes that cyclists wishing to make a left turn from a bikelane must make said turn by first proceeding straight across the intersection and then make their 90° left turn movement when all traffic control devices are set in favor of vehicles traveling in the direction desired by the cyclist. This total movement should be accomplished within the designated bike crossing. If this procedure is followed, the hazard described above should be eliminated.
2. The second major auto-bicycle conflict results from auto drivers not watching for cyclists on their right when making right-hand turns. A cyclist proceeding straight through an intersection often has to dodge right-turning autos. This problem could be reduced by placing a sign in good view of cyclists prior to intersections cautioning them of the potential hazard. The sign proposed by this plan would read "Bikes Yield to Right Turning Motor Vehicles".

Although the auto driver should be the yielding party, the above method is proposed by this plan because cyclists are most vulnerable to injury if an accident occurs and, thus, are well advised to be on the defensive.

SECURITY

Many people who now have bicycles use them less often than they wish, and for one good reason. Bicycles are not safe from theft when left unattended. Very few employers, shopping areas, churches, etc. have facilities where bicycles may be stored safely while the cyclist is away from his vehicle. It is impossible for the bicycle to ever become used extensively for these types of trips until measures are taken to assure the cyclist that his bicycle will be where he left it, available for his return trip.

Although it appears that absolute security is impossible, many systems have been developed which offer adequate security, especially when located in a well lighted, conspicuous area. Bike racks of the type which allow the front and rear wheels of the bicycle, as well as the frame, to be secured to them should be used. The racks should be anchored to the paved or concrete surface on which they are located.

Racks of this type should be provided at various locations along bikepaths and bikelanes as well as adjacent to:

- Public buildings
- Schools
- Shopping centers
- Parks
- Theaters
- Churches
- Hospitals
- Any land use which is used or would be used
by a significant number of cyclists

Employers may also wish to provide such facilities for their employees.

Bicycle registration should be continued in the county, and bicycle owners should be encouraged to register their vehicles. It is much easier to claim a registered bicycle, if stolen and recovered, than one which is not registered.

With a good registration program and the installation of good security hardware at strategic locations, bicycle theft should be less of a problem. This will help make the bicycle a more

attractive mode of transportation for short urban trips by giving the cyclist some assurance that his bike will still be there, ready for his return trip.

MULTI-MODE SUGGESTIONS

Bicycles have many advantages over other modes of private transit, as discussed in prior sections of this plan. Bicycles also have, however, some specific disadvantages. If bicycles are to be integrated into the total transportation system, these disadvantages must be realized and the system designed to capitalize on the advantages of all modes.

This plan proposes two mode mixes with the bicycle: auto/bicycle and mass transit/bicycle.

AUTO/BICYCLE

The dual mode possibilities of the bicycle in conjunction with the private auto have already been recognized by many people. Automobiles carrying bicycles are a common sight. The automobile is used to transport the bicycle to the origin of its intended use. This procedure is usually used for one of the following reasons:

1. A worker that lives outside the city and works in town can transport his bicycle to the city fringe, park his car, and conclude his trip on his bicycle, enjoying the advantage the bicycle has of avoiding holdups due to traffic. At the end of his working day, he rides back to his car for his return to the suburbs.

2. Recreational cyclists often transport their bicycles out of the city to a more serene environment to pursue recreational bicycling.

In order to assure the cyclist that the above alternatives are available to him, auto parking facilities should be included in the design of all recreational bikepaths. There is usually sufficient public parking available in urban areas; thus additional parking facilities should not be required in conjunction with urban or commuter type bikeways.

MASS TRANSIT / BICYCLE

Golden Empire Transit (GET), which now serves the Bakersfield Metropolitan Area, is currently investigating the possibilities of making provisions within its system for a transit/bicycle mode mix.

Two methods are available to make this mix possible:

1. The transit vehicles may be altered to allow bicycles to be carried along with passengers from their origin to some point (a bus stop) where the passenger will mount his bicycle and proceed to his final destination. This is a very satisfactory situation. It helps people who may wish to use the transit system but who are not served directly enough at this time to either their origin or destination point to make such use practical.
2. Also under consideration by GET are bicycle storage facilities at locations near bus stops. With proper planning, such facilities could make transit facilities much more attractive by eliminating that sometimes long walk to or from a bus stop. Security may be a problem at such facilities, but careful study should reveal solutions which are workable and economically feasible.

DETERMINING THE CORRECT BIKEWAY TYPE

It would be very difficult, if not impossible, to produce a set of generally applicable criteria for determining which type of bikeway should be used at any given location. It is possible, however, to explain the philosophy behind each of the three types, as proposed by this plan. This information should be sufficient, if followed by those in charge of implementing this plan, to properly appraise each proposed route and decide which bikeway type is appropriate.

BIKEPATHS

Bikepaths are, of course, the preferred bikeway type in any situation. However, bikepaths are very difficult to construct over an existing pattern of urban development. Therefore, bikepaths are most practical in areas which are not heavily developed with structures and complex street networks. They are appropriate in rural areas as recreational bikeways and certain urban areas as described below:

1. Through parks or public open spaces
2. Along canals, river banks, lakes, etc.
3. Within abandoned railroad or road rights-of-way
4. Along transmission line easements
5. In conjunction with new development
6. Anywhere space allows or safety necessitates this bikeway type.

It is important to remember that bikepaths are not only safest and most desirable for the cyclist. Where bikepaths are used, motor traffic will regain the use of the entire roadway.

BIKELANES

Bikelanes of the type illustrated in Figures (7-12) should be constructed along proposed routes when the following conditions exist:

1. The proposed route is along an existing road right-of-way
2. Development along the right-of-way, land ownership, or some other factor prevents the utilization of a bikepath
3. Hazards to bicyclists due to large amounts of motor traffic are significant
4. Present or anticipated bicycle traffic along the route is of a commuter or other medium to long distance type
5. There is a history of accidents involving bicycles along the route. Also, if there is a history of accidents along one route, this traffic may be rerouted along another route deemed more desirable by the implementing agency
6. It is determined for any other reason that this is the best method for satisfying a particular bikeway need.

Care should be taken when designing bikelanes along proposed urban routes to use one-way bikelanes as per Figures (7-11). During route selection, an effort was made to satisfy trip demand needs with routes having a relatively low demand for street-side parking in order to minimize conflicts on this issue.

Designated bikelanes should be constructed as per Figure (12) when located within the right-of-way of highways in more rural areas. This will provide the cyclist a clearly designated portion of the right-of-way at a reasonable cost.

BIKEROUTES

Bikeroutes are the least protective bikeway type, and therefore, should be used only in conjunction with streets supporting low speed, low volume traffic. This pertains primarily to residential streets.

The bikeroute sign is not designed to give the cyclist a false sense of security but rather to alert the motorist that bicyclists are likely to be encountered along this route. Bikeroutes can produce a higher level of safety for the cyclist when applied properly. However, care should be taken to only implement bikeroutes along routes where neither a bikepath nor bikelane can be justified.

BIKEWAY SIGNING

Bikeways lose much of their effectiveness if a good signing system is not used conjunctively. Signs help to warn cyclists and motorists of potential hazards, they warn motorists and pedestrians of the presence of bicycle traffic, and they provide on-the-spot right-of-way information.

Use of standardized signs is suggested whenever possible for ease of implementation as well as for a more universal comprehension and understanding by cyclists and motorists.

The National Joint Committee on Uniform Traffic Control Devices recommends three major bikeway signs. These are listed in the Manual of Uniform Traffic Control Devices and are graphically represented on Page 58. These signs are also recognized by the California Traffic Control Devices Committee. In addition to these three signs, this plan recommends the use of two additional signs. These signs and their purpose are discussed later in this section.

BIKEROUTE SIGN

This sign measures 24 by 18 inches, is green in color, and contains a white message consisting of a bike symbol and the words BIKE ROUTE in 3-inch letters. The purpose of the sign is to guide bicyclists along the course of a bikeway.

To indicate an impending change of course, a supplementary sign with a directional arrow may be placed below the BIKE ROUTE sign. This 24- by 6-inch rectangular sign contains a white arrow and border on a green background.

BIKE XING

This sign consists of a black bicycle symbol on a yellow background. The sign is diamond shaped and measures 30 by 30 inches. Below the diamond shaped portion, a 24- by 18-inch rectangular yellow sign bears the message BIKE XING in 6-inch black letters. Both messages are bordered in black and are reflectorized for effective night use.

This sign should be used to warn motorists of a bikeway crossing ahead. It should be used at all intersections where the potential for bicycle-auto conflicts is great and must be used to warn motorists wherever a designated bikeway facility crosses a public street or highway.

BIKES YIELD TO RIGHT TURNING MOTOR VEHICLES SIGN

This sign should be used before intersections along all bike-lanes and bikeroutes. Hopefully, use of this sign will eliminate many needless accidents caused by motorists not looking to their right before starting a right-hand turn. This has been a major cause of auto/bicycle accidents in the past. It is suggested that this sign be mounted on a common pole with the BIKE XING sign, where applicable.

NO BICYCLES SIGN

The NO BICYCLES sign, measuring 24 by 42 inches, contains a black bicycle symbol encircled in red. A red diagonal line bisects both the circle and bike symbol to emphasize the prohibitive nature of the sign. Beneath this symbol, on another sign, are the words NO BICYCLES in black letters. Both signs have a black border on a white background.

NO UNAUTHORIZED MOTOR VEHICLES SIGN

Section 23127 of the California Vehicle Code prohibits operation of unauthorized motor vehicles on bicycle paths. All paths should be provided with appropriate signing at appropriate intervals, as prescribed by said Section 23127.

SIGN LOCATION

Because of the absence of motor vehicles, signs may be placed closer to the edge of a bikepath than to either the bikelane or bikeroute. This is advantageous, as they are made more visible to the bicyclist. Lateral displacement from the bikepath should be approximately two feet. Vertical clearance from the ground to the base of the plaque should be approximately seven feet to avoid pedestrian conflict with the sign.

For bikelanes and bikeroutes and for areas where bikepaths are interrupted by cross traffic lanes, warning signs should be provided for both bicyclists and motorists. Warning signs for motorists should conform to standard roadway practices. Warning signs pertaining solely to bicyclists should be positioned as per Figures (7-12) and as existing conditions may require.

The BIKE XING sign is mandatory at all intervals where a bike-way crosses another right-of-way.

Note: Sign standards are often changed by State agencies, manufacturers, and by agencies responsible for sign placement and maintenance. For this reason, the sign types used for Kern County bikeways, especially those to be located within road and highway rights-of-way, would be left to the discretion of the agency having jurisdiction over said rights-of-way.



BIKEWAY SIGNS

Source: Manual of Uniform Traffic Control Devices

IMPLEMENTATION NOTES

1. Planning for bicycle facilities should become a part of the county transportation planning process so that transportation planners are vigilant in recognizing the opportunity for inclusion of cycling in future transportation schemes.
2. When planning new roads and when reconstructing older ones, consideration should be given to the incorporation of bikeways.
3. Bikeways should serve recreation and transportation needs by linking parks and other recreation areas, shopping areas, schools, employment centers, public facilities, and points of interest.
4. Bikeways should be as free from conflict with the automobile as possible. Priority among bikeway types should be as follows: bikepath, bikelane, bikeroute.
5. Non-street rights-of-way should be utilized where feasible. Examples are: within public parks or open spaces; along abandoned railroad rights-of-way; beside flood control channels, canals, river banks, and lakes; along transmission line easements; within abandoned street and highway rights-of-way; in conjunction with new development.
6. When road rights-of-way are used for bikeways, they should be evaluated on the basis of service, traffic control devices, traffic volume, speed limits, the existence of over/underpasses, right-of-way widths, parking, and other hazards to safe cycling.
7. Corridors with high incidence of bicycle accidents should be given priority for bikeway development.
8. Large user concentrations should be given a high priority for bikeway service.
9. Bikeways should be used as positive tools to improve the environment of the area they traverse through the use of landscaping and other visual treatments.
10. Where curb, gutter, and sidewalk are existing along a proposed bikelane route, it is not necessary to reconstruct them as per Figures 7-11. Landscaping would then be confined to dividers only.
11. Before implementation, each bikeway project should be assessed as to its possible environmental impact. An environmental impact report should be prepared for any project which may have a significant adverse effect.

12. Where bikeroutes and bikelanes cross existing islands or curbs, ramps should be installed so cyclists will not have to stop in order to cross these barriers. Ramps should also be installed at entrances to shopping centers and other land uses which may attract large numbers of cyclists.
13. Prior to construction of bikepaths, consideration should be given to the number, location, and type of sanitary facilities needed and to the method of supplying drinking water in conjunction with these facilities.
14. The Kern County Sheriff's office should, in cooperation with other governmental and law enforcement agencies, initiate an education program throughout the county to explain the proper use of the proposed county bikeways and the enforcement of the laws governing their use.
15. Responsibility for the patrol of bikeways and enforcement of the laws governing their use should be charged to whatever law enforcement agency has jurisdiction over the geographical area in which the bikeway is located.
16. The Kern County Department of Highways and Bridges should be responsible for the development of a comprehensive bikeways maintenance program for the county. Said program should be coordinated with other affected governmental agencies.

BIKEWAYS FUNDING SOURCES

As the use of bicycles increases throughout California and our nation, many of our legislators are recognizing the need and, often, demand for bicycle-oriented facilities by their constituents. This recognition has inspired much recent legislation directed toward funding assistance to local governments involved in creating bikeways systems. Funding programs are now being administered by many State and Federal agencies for bikeways projects, with each program directed toward a different aspect of bikeways planning or implementation.

Amendments are common to bikeways funding legislation, and new programs are constantly being financed by the State and Federal governments. For this reason, a complete list of all available funding programs is not feasible as part of this plan. Some of the most promising sources are described below, however, along with some suggestions as to how these sources might best be utilized to finance bikeways in Kern County.

STATE PROGRAMS

1. S.B. 36 (Mills, 1972). This bill allocates a minimum of \$360,000 annually from the State Highway Fund for construction of bicycle facilities along the State Highway System. It also established the Bicycle Lane Account, which reserves \$30,000 per month from the gas taxes collected for cities and counties for construction of bicycle lanes along local streets and roads. This account requires an annual progress report and would require a commitment by the County for at least one-third of the project cost.
2. On October 17, 1973, the California Highway Commission approved the 1974-75 State Highway Budget, which includes \$700,000 for new bikeway construction. These funds are from the State highway gas tax and must be used only along State highways where it will increase the traffic capacity or safety of the highway.
3. Not associated with the State Highway Budget is the new State Law S.B. 821, by Senator Mills, for 2% of gasoline sales tax local transportation funds to be used to build bicycle and pedestrian facilities, unless the regional planning agencies have a more urgent need for the funds.

This could bring an estimated three million dollars for bikeway construction by cities and counties if other priorities do not intervene.

4. The Transportation Development Act of 1971, as enacted by S.B. 325 (1971), will be responsible for contributing about \$1.6 million to Kern County this year to be used for transportation planning and related projects. Transit projects have the highest priority for these funds, and approximately half of the County's allocation will go to the Golden Empire Transit. This leaves about \$800,000 to be used as the County sees fit for transportation related projects. A recent amendment of this bill has placed bikeways projects first on the non-transit fundable projects eligibility list.

This money is very important in that it can be used as matching funds to secure grants from other sources.

FEDERAL PROGRAMS

1. The Federal-Aid Highway Act of 1973, Section 217, Bicycle Transportation and Pedestrian Walkways, provides funds for "the construction of separate or preferential bicycle lanes or paths, bicycle traffic control devices, shelters, and parking facilities to serve bicycles and persons using bicycles, and pedestrian walkways in conjunction with Federal-Aid Highways." This legislation marks the recognition by the Congress of the usage of bicycles as a viable mode of transportation.
2. The Land and Water Conservation Fund of the Bureau of Outdoor Recreation provides matching funds for bikeways. First priority for these funds is recreational bikeways. Since several recreational type bikeways are proposed by this plan, this source may prove valuable.

This program reimburses applicants for one-half of the funds actually spent on the project. Funds returned to the applicant are eligible for matching with more Federal money on a continuing basis. The only stipulation is that the money has to be spent before it is matched.

SUGGESTED FUNDING STRATEGY

Currently, most of the County's share of the funds received from the State, pursuant to S.B. 325 (1971), is used for the construction of county streets and highways. Often, surplus monies are left from this fund, requiring solicitation of second priority projects by the administrative agency (KernCOG).

It is suggested that the County's share of this fund be redistributed according to one of the procedures described below.

1. A percentage of the County's portion of this money (which totals approximately \$800,000 for 1974) should be set aside each year to fund bikeway projects. This money may not all be spent when allocated but, if not, should remain in a County fund to be used exclusively for this purpose.
2. As a less desirable proposal, but one that does merit consideration, the County could reserve a percentage of any monies left over from this fund after first priority projects had been financed. This percentage could then be used as described in the first suggestion.

Note: It should be remembered that funds received as a result of the Transportation Development Act of 1971 may be used as local funds for matching purposes toward other grants.

3. As a third method, and possibly the most cumbersome of the three methods suggested, the Board of Supervisors may approach every bikeways project separately and require an individual funding report from the designated County agency. This method would be effective but would be considerably more awkward and time consuming than those methods described earlier.

Note: It will be necessary when applying for many of the grants described above to coordinate with the Transportation Planning Agency for Kern County (KernCOG).

"The general benefits accruing from even limited alleviation of motor vehicle congestion make the investment of public funds to develop alternatives, such as the bicycle, highly cost-justified."

James P. Hamill
Director of Planning
Applications, Pan-Technology
Consulting Corporation
Washington, D. C.

SUGGESTED BIKEWAY ROUTES

The following maps define the routes felt most appropriate by the project staff for use as bikeways in Kern County. Route systems were not developed for cities whose jurisdictional boundaries encompass complete urbanized areas. Route proposals have been made for the cities of Bakersfield and Taft because of the large portion of each of those urbanized areas which is unincorporated. Within these two areas great effort should be made to coordinate with the cities toward adoption by their legislative bodies. Only by this method may the plan be implemented in Taft or Bakersfield.

A priority system is also presented on the following maps. This system was developed to provide a guide toward the implementation of a functionally expanding bikeways system. If at any time it is determined by the Planning Commission that changes are needed in this or any other portion of the plan, these changes should be made and the plan amended.

All incorporated cities within the county were contacted during the preparation of this proposal. Most cities indicated an interest in bikeways. Some have already initiated a plan and are working toward its implementation, while others indicated that they wish to wait and review this plan. In any event, the county, when requested to do so by any individual city, stands ready to cooperate and assist them in the development of such a plan.

Notes: 1. The North of the River Recreation District is presently working on a bikeway system to serve their district. Every effort should be made by the County of Kern and the City of Bakersfield to coordinate bikeway route alignments, thus preventing effort duplications.

2. The following route maps show only general route locations. For this reason, some of the proposals may appear inappropriate at first glance. It is strongly recommended that prior to implementation of any of the route proposals, inquiry be made to the Planning Department to obtain the exact route alignment intended by this plan.

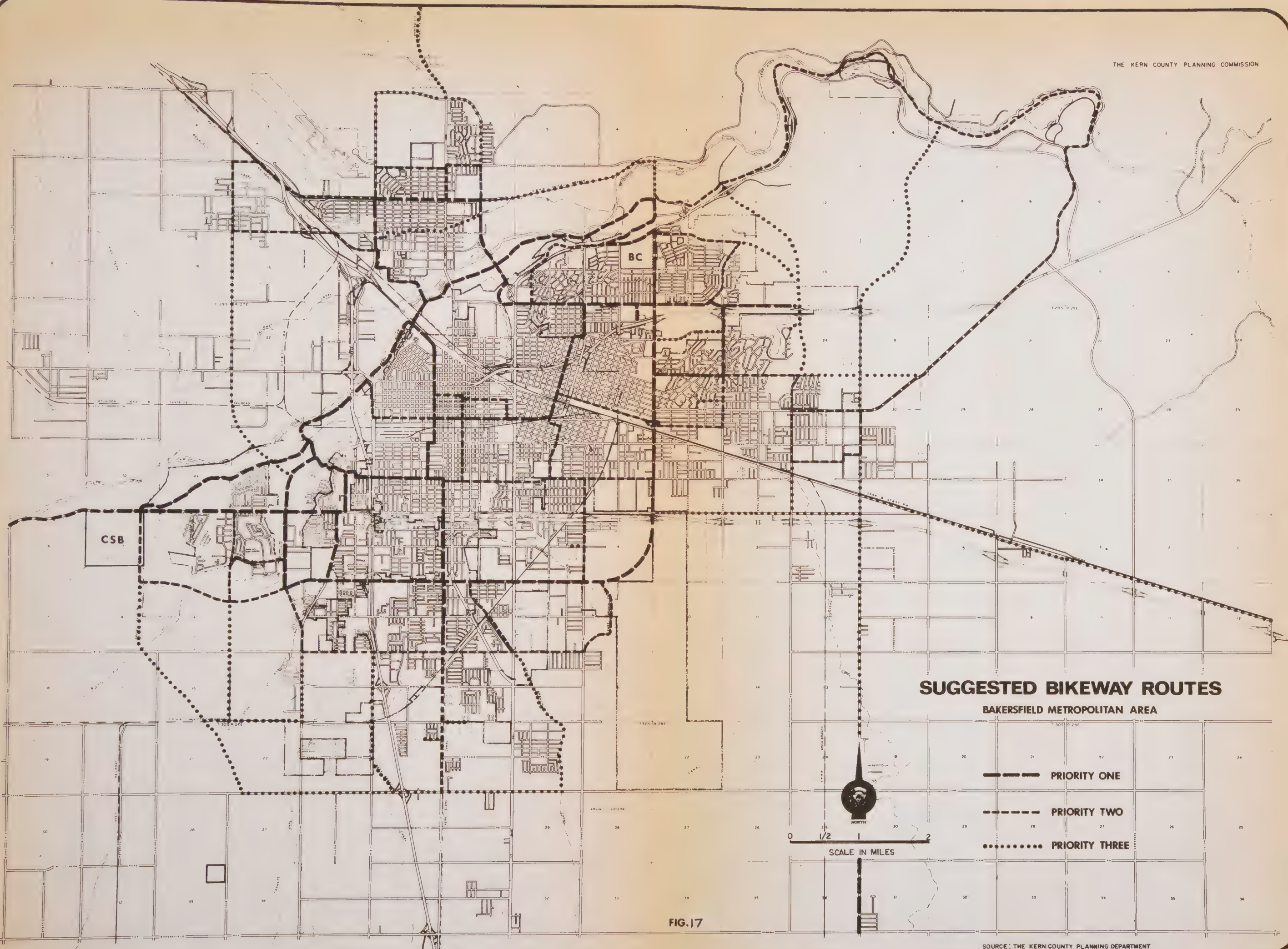
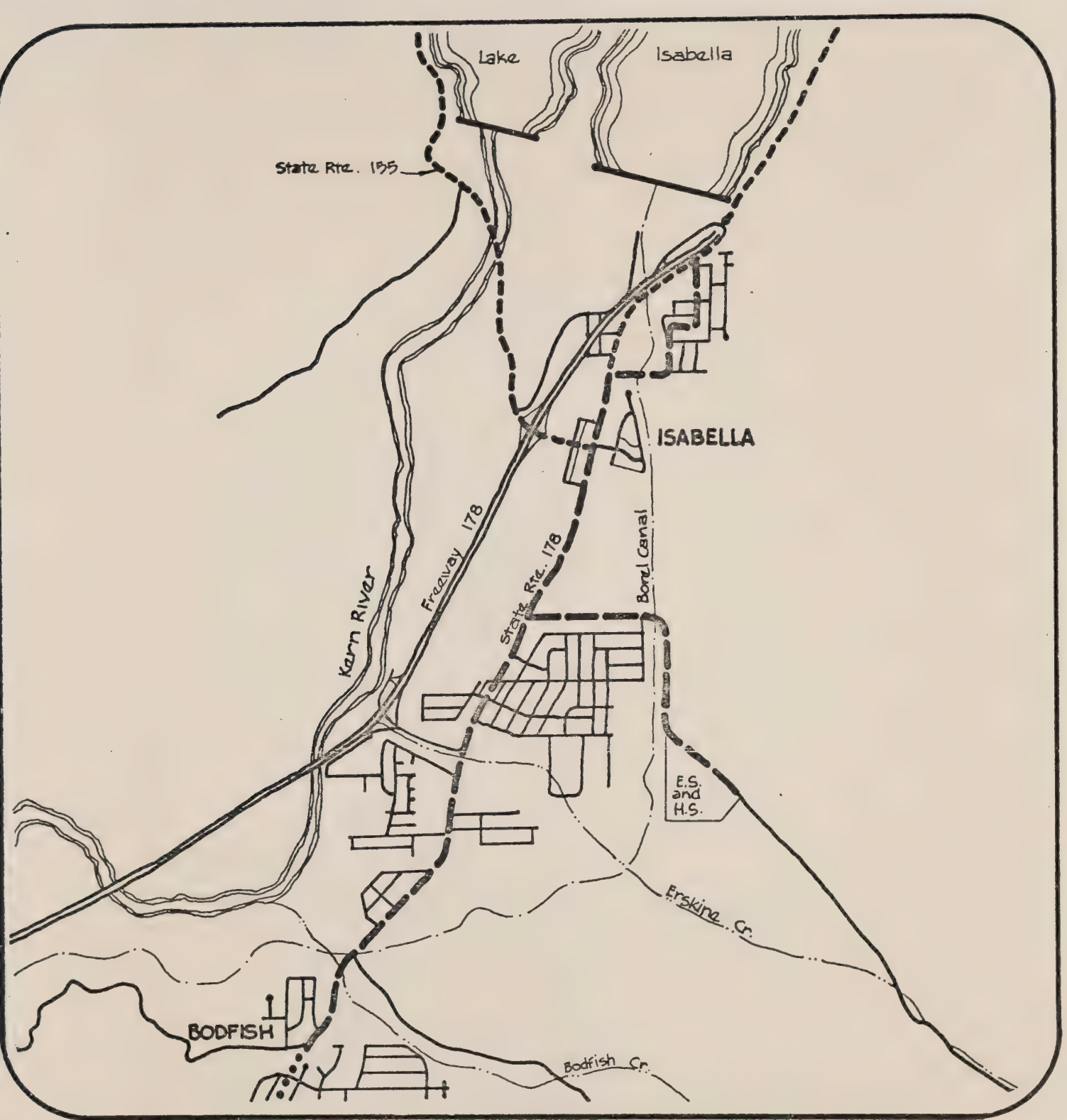


FIG. 17



SUGGESTED BIKEWAY ROUTES **HOT SPRING VALLEY**

Fig. 18



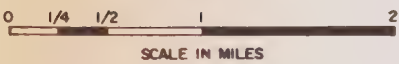
0 1/4 1/2 1
 SCALE IN MILES

- PRIORITY ONE
- - - - - PRIORITY TWO
- PRIORITY THREE



SUGGESTED BIKEWAY ROUTES

ISABELLA LAKE AREA

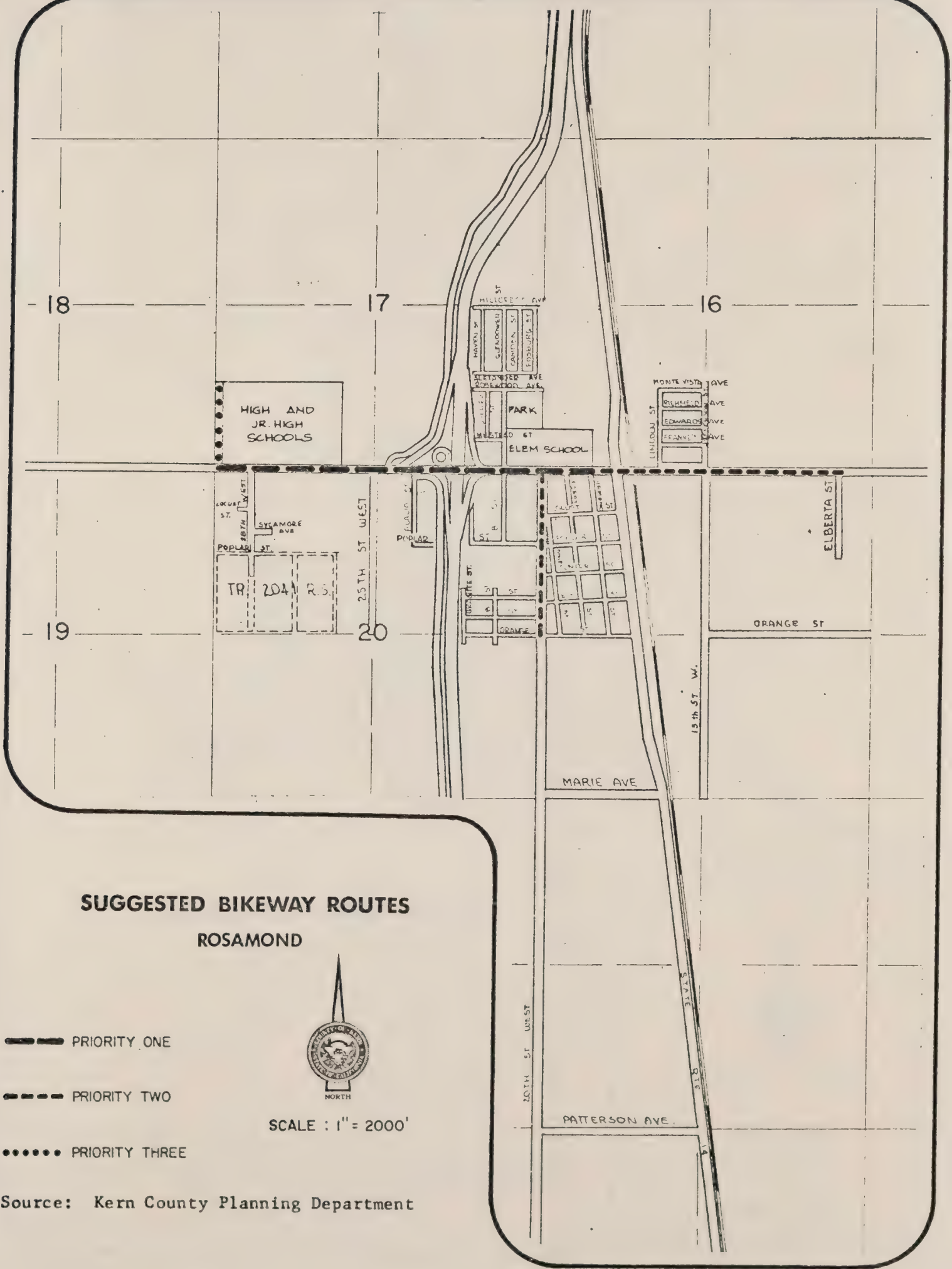


- PRIORITY ONE
- - - - - PRIORITY TWO
- PRIORITY THREE

SOURCE: THE KERN COUNTY PLANNING DEPARTMENT

FIG. 19





SUGGESTED BIKEWAY ROUTES

ROSAMOND

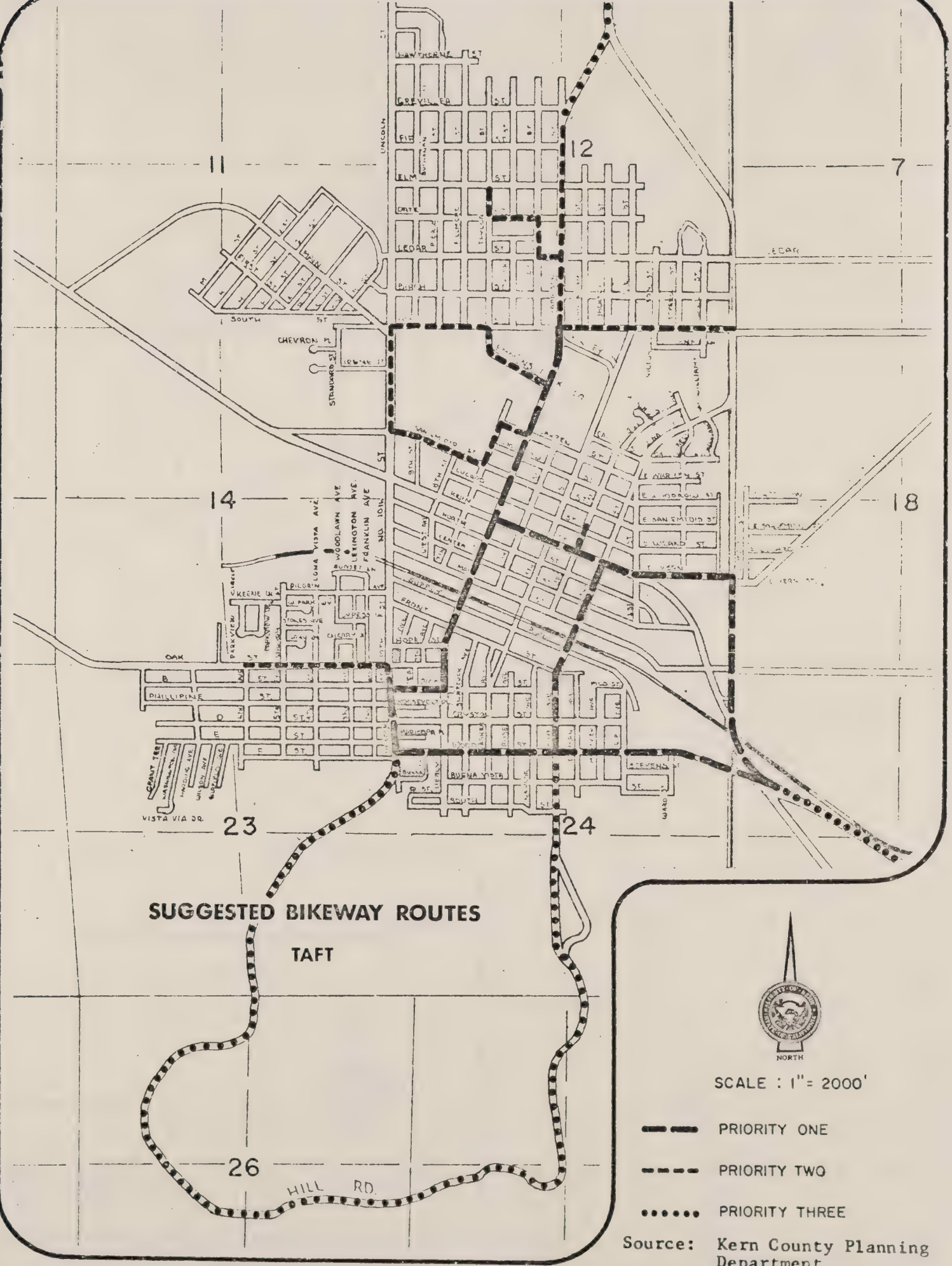


SCALE : 1" = 2000'

- PRIORITY ONE
- PRIORITY TWO
- PRIORITY THREE

Source: Kern County Planning Department

FIG. 20






SUGGESTED BIKEWAY ROUTES

TAFT

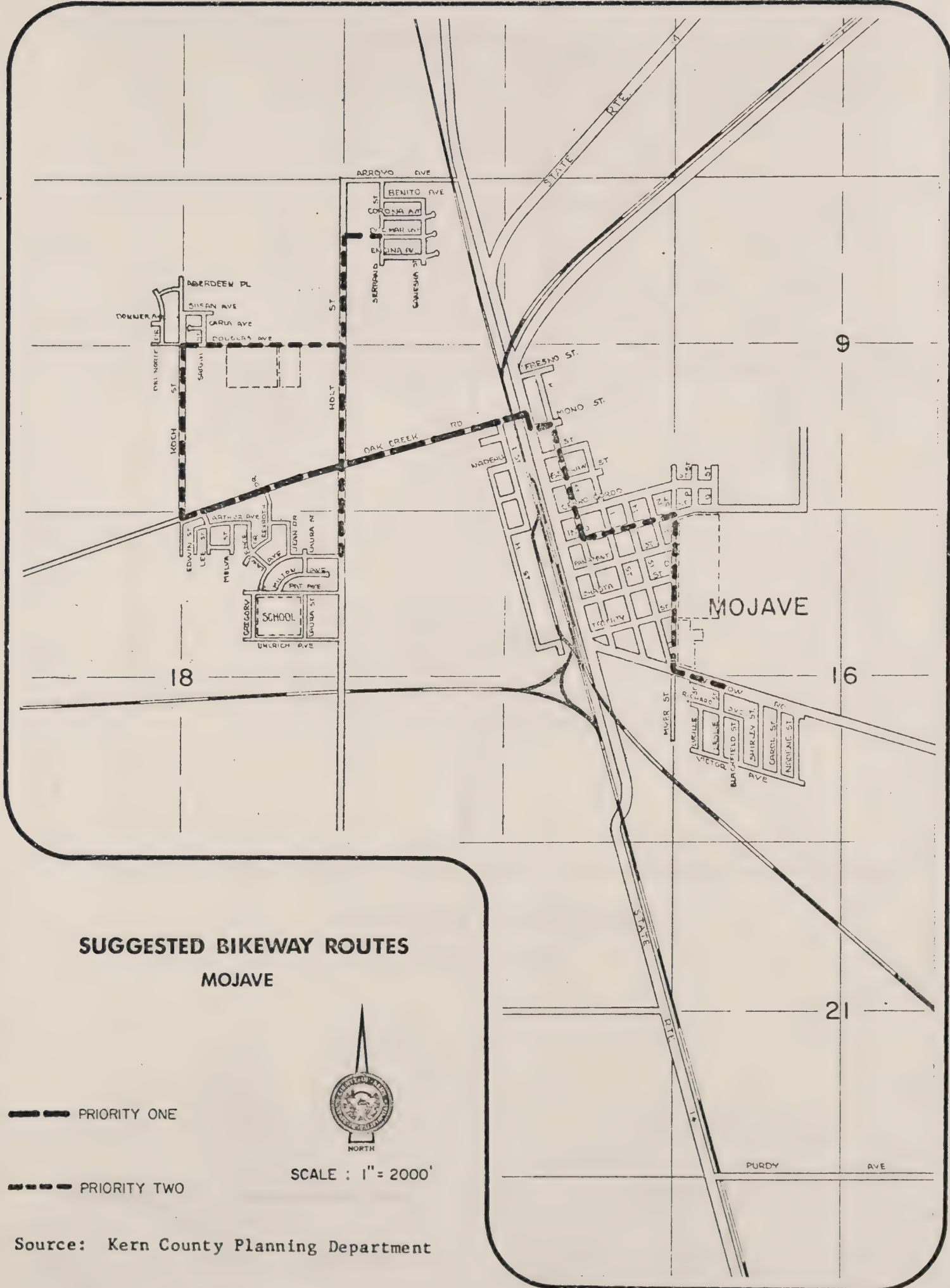


SCALE : 1" = 2000'

-  PRIORITY ONE
-  PRIORITY TWO
-  PRIORITY THREE

Source: Kern County Planning Department

FIG. 21



SUGGESTED BIKEWAY ROUTES
MOJAVE

———— PRIORITY ONE

- - - - - PRIORITY TWO



SCALE : 1" = 2000'

Source: Kern County Planning Department

FIG. 22



SUGGESTED BIKEWAY ROUTES

LAMONT AREA



Source: Kern County Planning Department

FIG. 23

"It's an ideal way to see our cities, countrysides, our parks, and a perfect way to explore the natural wonders of America. The bicycle is certainly unique when you recall how it is possible to combine so much health in the pursuit of pleasure."

"What we do today will have direct bearing on the strength, health, and happiness of our people in future generations. The bicycle explosion in our country is a single manifestation of the desire of our people to find an answer to this broad new dimension--the need for new recreational outlets."

Stewart L. Udall
while speaking before the
Congressional Conference on Bicycling in America

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The Bakersfield Californian

Bakersfield City Police Department

California Highway Patrol

California State College, Bakersfield

California State Department of Transportation

Kern County Council of Governments

Kern County Fire Department

Kern County Library System

Kern County Public Works Department

BIBLIOGRAPHY

1. Arizona Bikeways, A comprehensive bicycle program for Airzona, by the Arizona Highway Department in cooperation with the Federal Highway Administration, Arizona Outdoor Recreation Coordinating Commission, and the Bureau of Outdoor Recreation, consulting services by Bivens and Associates, Inc.
2. Bakersfield Area Bicycle Collision Profile, California Highway Patrol.
3. Berkeley Bikeways Plan, by the Local Transit Study Committee of Berkeley, CA., adopted by Berkeley City Council, April 27, 1971.
4. Bike Trails and Facilities - A guide to Their Design, Construction, and Operation, by Walter L. Cook, Assistant Executive Director, American Institute of Park Executives, Oglebay Park, Wheeling, West Virginia, Copyright, May, 1965.
5. Bicycle Lanes in Davis, California - First Year Report, Dale F. Lott and Robert Sommer, Dept. of Psychology, U.C.D., Davis, Ca., July 7, 1969.
6. Bikeway Planning Criteria and Guidelines, for the State of California Business and Transportation Agency, Dept. of Public Works, Division of Highways, by the Institute of Transportation and Traffic Engineering, School of Engineering and Applied Science, University of California, Los Angeles, UCLA-Eng-7224, April, 1972.
7. Bikeways in action: The Davis Experience, by Robert Sommer and Dale F. Lott, University of California, Davis. Presented as a public service by: The Bicycle Institute of America, 122 E. 42nd Street, New York, N. Y.
8. Boom in Bikeways, Bicycle Institute of America, Inc., Vol. 6, No. 2, July, 1971, and Vol. 7, No. 3, July, 1972.
9. California Bikeway Standards, by W. D. Pyle, Supervising Highway Engineer, California Division of Highways, December 11, 1972.
10. "C.H.P. Schools Launch Massive Bicycle Safety Program," by Jeanne Daughton, Auto Club News Pictorial, June, 1973.

11. Footpaths and Bike Routes, Standards and Guidelines, Oregon State Highway Division, January, 1972.
12. "Grand Opening" - of the California Aqueduct Bikeway, DWR News, State of California, The Resource's Agency, Dept. of Water Resources, November 1972.
13. Guidelines for a Comprehensive Bicycle Route System, Dept. of Development and Planning, City of Chicago, March 26, 1971.
14. "Pedal Power" by Ralph Hannerman, Parks and Recreation, Vol. VI, No. 1, January, 1971.
15. Planning Criteria for Bikeways, Vincent R. Desimone, P.E., Transportation Planning Engineer, Automobile Club of Southern California, presented at the American Society of Civil Engineers' National Transportation Engineering Meeting, Milwaukee, Wisconsin, July 17-21, 1972.
16. "Planning and Development of Bikeway Systems," by James P. Hamill, Urban Land - News and Trends in Development, October, 1973.
17. Proposed Dade Bikeways Plan, Metropolitan Dade County Planning Department, Dade County, Florida, April, 1972.
18. Ride Your Way to Fun and Fitness with Cycling, by Roy Ald, Foreword by Paul Dudley White, M.D., with Curtis Mitchell.
19. Some Facts about the Current Bike Explosion, Bicycle Institute of America, Inc., by J. Hayes, August 12, 1971.
20. Special Survey on Bicycling and Bicycle Accident Records, Public Safety Dept., Automobile Club of Southern California, by Beverly J. Hammond, Research and Planning Analyst, July 14, 1972.
21. Transportation Development Act of 1971, Extract of the Government Code, Public Utilities Code and California Administrative Code, State of California Business and Transportation Agency, January 2, 1974, and June, 1972.
22. The "Urban Bicycle Route System" for the City of Palo Alto, by City of Palo Alto.

23. Urban Design to Encourage Bicycle Use, Dan Smith, Jr.,
Transportation Planner, De Leuw, Cather and Company, San
Francisco, California.
24. "1972 Bicycle Legislation in California", (Final Report
December 7, 1972), compliments of Senator James R. Mills.
25. Letter to the Kern County Board of Supervisors by Judge
Earle J. Gibbons, dated April 25, 1972, re: Bikeway from
California State Bakersfield to Bakersfield Community
College.
26. Report to the Kern County Board of Supervisors by the
Kern County Public Works Department, re: Bikeway from
California State Bakersfield to Bakersfield Community
College.
27. Rules and Regulations for the Administration of the Bicycle
Lane Account established by S.B. 36, 1972, excerpt of
Title 21, Chap. 2 of the California Administrative Code,
as adopted by the California Department of Public Works,
(Now Department of Transportation).

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